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DEPARTMENT OF ARCHIVES

GOVERNMENT OF MAHARASHTRA, MUMBAI.

NAME OF RECORD : **REVENUE** DEPTT. VOL.

NO : 90/1071

YEAR : 1890

EXPOSED BY : ANIL SAWANT

DATE : 09/05/2008

1890.

Rev. Dept.

No. 1071

Forests

Kaingaroa

North-Kaingaroa Forest

Railway

Former Papers in Comp. No. 798 of 18 90

Subsequent " No. of 18

2693

P. W. Department

Unofficial reference No. 05 dated 25th April 1888, to the Revenue Department

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List of papers.

Rev. Dept. Trans. No. 2297 dt. 14/4/88
Conservator of Forests No. 5498 dt. 24/3/88 with accompts.
Minute by the Hon'ble Mr. Ricketts dt. 2/4/88
Minute by H. E. the Governor dt. 4/4/88
Minute by the Hon'ble Mr. Ricketts dt. 6/4/88
Minute by Hon'ble the Governor dt. 12/4
B. I. No. 3505 dt. 2/4/88 - 2 3304, 3254, 3524 encls.
Corresp. Engrs. Nos. 2442 dt. 11/4/88
Maps.
Proceedings for January 1181-1185 dt. [illegible]
Proceedings for March 643-644
Comp. 238/87

W. O. Ro No. 025 dt. 4/5/88 to Rev. Secy. Read & Circulate

As above with note by Chief Engr. & Secy. to Govt.
Note by Hon'ble Mr. Ricketts 28/5/88

039 617 2
8091
7837

Ord. June 23/38 March 4/45
Ord. June 525/526 March 307/-
Feb —— 25/26 March 643/644
May —— 569/571 C/2 38/81
June 502/504
June 507/529
June 536/
Jan 1 118/185

6172 ✓ 793;
1.6.88. 809/1

No 4550. Forest

From The Conservator of Forests
Southern Circle

To The Under Secy to Government
Revenue Department
Bombay

Conservator's Office, S.C.
Dharwar 25th January 1888

RECD FEB 1 1888

Sir,

In reply to your No 7470 of the 3rd November 1887, I have the honor to report that Messrs Bell and Oliver, Assistant Conservators have been directed to collect the data necessary for the preparation of a working-plan of the forests which would be tapped by a railway between Nagargali and Gund.

2. The area on the western slope of the ghats, from which the Kodibail depôt is supplied with timber is estimated to be fifty square miles, and the unworked area above ghats, which would be tapped by a railway from Nagargali

to Gund is estimated to be 25 square miles, the rest of the area to be worked by the railway being estimated at 175 square miles.

3 I have two suggestions to make in regard to this project, and beg, therefore, to submit them for the consideration of Government.

4. In the first place, I notice that the ruling gradient is to be the same throughout, but, as the trains will go quite empty one way, the ascents from Nagargali towards Gund might be made steeper than those of the return-journey

5. The other suggestion I wish to make is that a 2ft-inch gauge should be substituted for the metre-gauge.

6. I have obtained from Messrs Fowler & Co, of Calcutta and Leeds, an estimate of the cost of a 2ft-inch gauge. This estimate shews that the permanent way necessary for 33 miles of line, together with sufficient rolling stock to

remove

remove the estimated quantity of forest produce from the jungles to Nagargali - Depôt could be placed in the harbour of Bombay - presumably also in that of Murmagao - for a sum of £2274 or Rs 32,964 at the present rate of exchange (1/5)

7. Major Forbrace's estimate for 32 miles of metre-gauge permanent way together with the requisite quantity of rolling-stock comes to Rs 631104. This shews a balance of Rs 110940 in favour of the 2ft 6inch gauge. It is true that Major Forbrace proposes to utilize the rolling stock of the Southern Maratha Railway, but the Company must naturally first strengthen rates so as to provide for wear and tear, and nothing would be gained financially by not having our own. On the other hand it would be a great advantage to the Forest Department to be independent. The busy time of the Company would also be our busy

busy time, and we should run the risk of not getting out our wood before the end of the fair season owing to press of work on the main line or an insufficiency of timber-trucks I believe there would be very great risk in this respect

8. Another reason for having our own rolling-stock is that trucks have to be specially constructed for timber-work In the accompanying Catalogue, at page 45, will be found a drawing (H H) of the kind of wagon which will be mainly required. It is specially constructed to carry heavy weights up to 4 tons and is furnished with swivelling gear to enable the trucks to go safely round curves. It is scarcely likely that the Company would construct and keep up a sufficient stock of these specially constructed wagons.

6 Enclosures
1

9 Major Fitzmaces estimate provides for the carrying of 200 tons yearly. The 2ft-inch gauge locomotive would haul, say, 35 tons up gradients of 1 in 30. The number of working days during the year cannot safely be taken at over 180 ~~days~~ & each locomotive would have to make 2 trips a-day, & there would have to be a number of trucks to enable the workmen to load continuously so as not to detain the engines unnecessarily. Three locomotives have therefore been considered requisite – two for transporting produce to depot, and one for shunting – but this matter, as well as other items of the estimate, may require modification when examined by an expert.

10. Other advantages to be gained by a narrow gauge with steel sleepers, are that it could be laid & kept in order by unskilled labour (which does not appear to be the case when the sleepers

to Gund is estimated to be 25 square miles the rest of the area to be worked by the railway being estimated at 175 square miles.

3 I have two suggestions to make in regard to this project and beg therefore to submit them for the consideration of Government

4. In the first place, I notice that the ruling gravient is to be the same throughout but, as the trains will go quite empty one way, the ascents from Nagargali towards Gund might be made steeper than those of the return-journey

5 The other suggestion I wish to make is that a 24-inch gauge should be substituted for the metre-gauge.

6. I have obtained from Messrs Fowler & Co, of Calcutta and Leeds, an estimate of the cost of a 24-inch gauge This estimate shows that the permanent way necessary for 33 miles of line, together with sufficient rolling stock to

remove

remove the estimated quantity of forest produce from the jungles to Nagargali - depot could be placed in the harbour of Bombay - presumably also in that of Murmagao - for a sum of £227½ or Rs 3,21,964 at the present rate of exchange (1/5).

7. Major Firebrace's estimate for 32 miles of metre-gauge rail together with the requisite quantity of rolling-stock comes to Rs 1,31,104. This shews a balance of Rs 1,10,940 in favour of the 2½-inch gauge. It is true that Major Firebrace proposes to utilize the rolling stock of the Southern Maratha Railway, but the Company must naturally fix its rates so as to provide sinking for wear and tear, and nothing would be gained financially by not having our own. On the other hand, it would be a great advantage to the Forest Department to be independent. The busy time of the Company would also be our busy

busy time and we should run the risk of not getting out one wood before the end of the fair season owing to press of work on the main line or an insufficiency of timber trucks I believe there would be very great risk in this respect.

8. Another reason for having our own rolling-stock is that trucks have to be specially constructed for timber-work On the accompanying Catalogue, at page 45, will be found a drawing (H H) of the kind of waggon which will be mainly required. It is specially constructed to carry heavy weights up to 4 tons and is furnished with swivelling gear to enable the trucks to go safely round curves It is scarcely likely that the Company would construct and keep up a sufficient stock of these specially constructed waggons.

6 Enclosures

9 Major Finlayson's Estimate provides for the carrying of 250,000 tons yearly. The 2ft-6in gauge locomotive would haul, say, 35 tons up gradients of 1 in 30. The number of working days during the year cannot safely be taken at over 180 ~~days~~ & each locomotive would have to make 2 trips a-day and there would have to be a number of tracks to enable the workmen to load continuously so as not to detain the engines unnecessarily. Three locomotives have, therefore, been considered requisite – two for transporting produce to depot, and one for shunting – but this matter, as well as other items of the estimate, may require modification when examined by an expert.

10. Other advantages to be gained by a narrow gauge, with steel sleepers, are that it could be laid and kept in order by unskilled labour (which does not appear to be the case when the sleepers are

are made of wood) and that also be more rapidly and cheaply taken up and transported to fresh sites. Should it hereafter be found necessary to remove it to another part of the country. Considering that we dont yet know — nor are likely to know before the Railway is made — the sustained yield of the forests in the vicinity of the proposed line, this is an advantage which is not to be despised. A further advantage would be that the earth and bridge-work would be cheaper no doubt an Engineer could say what the relative saving would probably be I imagine it would be considerable, as I am informed that 6 feet would suffice for the width, at top, of embankments, against an estimate of 12 feet for the larger gauge.

11 The one possible disadvantage of the 2ft-inch line is the break

of

of gauge it would cause where it joins the S. Fr. Railway.

12. Colonel Peyton, with whom I have discussed the subject agrees with me in thinking that we ought to have our own rolling-stock, but at the same time is of opinion that the 24-inch rails would be altogether too weak for the work and that a break of gauge is sufficient to condemn it.

13 The first objection could be easily decided by an Inspect.

14. The second question is not so easily set at rest. At first sight, the break of bulk certainly does seem an insuperable obstacle, but on a full consideration of the special circumstances it will be found to be a much less serious matter, because all timber, or nearly all timber will have to be collected

from

for sale at a depôt. I am of opinion that all timber will have to be so collected The nearer this depôt is to the places of consumption, and the further it is from the malarious jungles in which the timber is found, the better will be the prices realized at sales. The most suitable place for it would undoubtedly be the junction of the line with the S. E. Railway Colonel Perston anticipates a large trade in timber with logs purchased by private contract which would go direct from the jungle to the places of consumption, thus saving the unloading and reloading at a depôt. For my own part, I cannot see how we are to avoid collecting the timber at some central spot where purchasers can select logs suitable for their requirements

the

The exploitable timber trees, it should be noted, are scattered over the forest instead of being concentrated in one spot. A purchaser travelling along the line could certainly select such logs as suited him from amongst those that happened to be on the line at the time of his visit but he would find it more convenient to inspect the logs lying about in the forest. As fast as the logs come down to the line, they will have to be sent on trucks and despatched to the junction, in order that the estimated quantity may be got out to a safe place before the setting in of the rains. Even for logs purchased by private contract it appears to me therefore, that a depôt is essential, and that this depot must, for the convenience of purchasers and the proper working of the line, be fixed at

the junction. For wood purchased at auction, there can be no doubt about the matter and hitherto our timber above ghats, has been almost entirely disposed of by public auction. I think that is much the best mode of selling it to the public.

15. As regards the transport of firewood, I must admit a doubt that the 2 inch gauge would prove as efficient as the metre-gauge. Colonel Bryton considers that there will be a large traffic in fuel direct from these jungles to places of consumption (Hubli, Gadag, Dharwar, etc) If that should prove to be the case, the break of bulk would be a decided disadvantage. I am, however, of opinion that the forests in the immediate vicinity of the S.M.R. - within 2 miles of the line - could furnish double the quantity of the firewood now

now supplied to the railway and the public. Should this turn out to be the case, it does not seem necessary to look further afield for the present. Mr Murray is now engaged in making an estimate of the standing-stock on each side of the line, and I hope that before the end of the working season, he will have gained a good idea of the possible yield. In the meantime, I think it may be safely assumed that an acre of forest traversed by the S.I.R. Railway between Vagargali and Khanapur, a distance of 27 miles, will yield at an age of 25 years, on an average, 20 tons of fuel. If one 2 miles be taken on either side of the line, a sufficient area would be available to yield, at the above rates, 55000 tons annually, or nearly double the present consumption of 30,000 tons

tions. In addition to the area available for firewood in this direction a considerable quantity could be obtained between the Londe and Castle Rock stations, a distance of 15 miles by the railway, which runs through firewood jungle, but as I have allowed no deductions on account of cultivated land between Nagargali and Khanapur, which is probably about one-third of the whole, I do not take the wood derivable from this source into account.

Colonel Peyton also thinks that there would be greater opportunities for fraud on the part of subordinates and contractors if there were a break of gauge. I think he is right in regard to all wood which could if there were no break be dispatched direct from the jungle to places of consumption, but if timber were first removed to a depôt, as I understand it should

do

be, the objection would not hold good in respect of it, whilst as regards firewood I think I have shewn above how doubtful it is that we shall have to resort to these forests for the supply of fuel within a measurable period.

I have the honor to be,
Sir,
your most obedient servant

A. L. Lushington
Conservator of Forests
Southern Circle.

3/2·86 409
4.7.58
16/2/1988 12822

(All communications to be addressed to the Firm.)

JOHN FOWLER & Co. (LEEDS), LD.
ENGINEERS
STEAM PLOUGH & LOCOMOTIVE WORKS.
LEEDS

6, MANCOD LANE.

LONDON - 8 LOMBARD STREET
EDINBURGH INDIA BUILDINGS.
MAGDEBURG CENTRAL BAHNHOF
PRAGUE - PRLASTERGASSE 5 NEU.
HAVANA { APARTADO 583.
LAMPARILLA 2t
SYDNEY { 43 YORK STREET
WYNARD SQUARE

CHARLES MORRIS,
INDIAN MANAGER.

To Conservator of Forests
Southern Circle
Dharwar

Calcutta, 10th January 1888.

Specification and Estimate.

—Of—

31 Miles of Fowlers Patent permanent way system D, described and illustrated on pages 18 & 19, 2 ft. gauge, steel flat bottom rails 24 per yard, and steel corrugated sleepers, spaced 2-9" centres and projecting 7½ inches each side of gauge, with fish plates, bolts and fastenings complete, one mile being to cover price of crossings, sidings and switches &c gear) at £530. per mile ——— £16430

2 Miles of Portable Rly System A 2 ft gauge, rail 4 lbs per yard for laying about in forest and shifted from time to time, with Fowlers Patent double sleepers instead of fish joints at £236 per mile ——— £472

6 Crossings 2 turntables &c for 4 lbs line ——— £60

20 Bogie platform waggons tipper to carry 6 tons, with racks on iron frame, so that posts may be put at sides to required height, platform 15 ft. by 5 ft. at £50 (see page 49) ——— £1000

50 Pairs Specially constructed bogies for carrying logs of 4 tons, with chains &c complete as per H.H. on page 48 — at £40 ——— £2000

2 Passenger Luggage & brake waggons as per page 50 at £48 ———

Carried over £

Brought forward 2014

2. Cheap passenger cars to carry 16 persons each
as per "Drawing No. 30668 at £40 each ——— 80
3 Patent-Narrow gauge Locomotives Cylinders
9"x12" with Joy's Patent-Valve gear, Coke fire box suitable for burning wood, Spark
arresters two wheeled bogie unit fit complete
as per drawing No. 22026 at £630 each ——— 1890
Two 10 ton Cranes 7 ft. radius 12 ft. lift-as per
page 52 at £65 each ——— 130
Water tanks, Hydrants 2 reversible, inspection
trolley, platelayers tools, Corrugated iron
for Engine sheds, spare cranes, fitting &c. ——— 500 - -
Total £ = 22742 - -

The Prices are for delivery for Clients
Bombay, Harbour

P. P. JOHN FOWLER & CO. (LEEDS) "LIMITED."
Chas Morris

The Corp. of Trinity
Southern Circle
Leading Dimensions
Standard Locomotive Engines

Cylinders Diam.		5"	6"		
Cylinders Length of Stroke		9"	10"	12"	
Coupled Wheels Diam.		20"	24"	26"	24"
Coupled Wheel base		2-6	3-0	3-6	4-0
Total Wheel base		6-6	7-6	7-0	8-5
Heating Surface in fire box	sq. ft.	12	15	20	20
Heating Surface in tubes	" "	88	119	163	180
Total Heating Surface	" "	100	134	183	200
Grate area	" "	2	3	3-5	4-5
Tank Capacity	in Gallons	90	100	120	200
Coal Bunker Capacity	in cubic ft.	10	11	12	15
Weight Empty	in Tons	4	6½	7½	8
Load on level	" "	50	67	110	160
Load up 1 in 50	" "	15	20	30	40
Gauge	in inches	18 to 30	18 to 30	18 to 30	24 to 42
		£	£	£	£
Price		440	560	645	680
With iron fire box & Steel tubes		20	20	30	40
If 4 coupled wheels without bogie		15	20	20	25

Packing & Delivery F.O.B. Liverpool
6 p.c. Extra.
1st Dec. 187?

No. 43. PART IV.

DESCRIPTIVE CATALOGUE

OF

LIGHT RAILWAYS

AND

ROLLING STOCK.

JOHN FOWLER & CO. (Leeds), Limited,

ENGINEERS,

STEAM PLOUGH WORKS, LEEDS, YORKSHIRE.

LONDON 6, LOMBARD STREET, E.C

MAGDEBURG. Central Bahnhof PRAG: Pflastergasse, 8.

SYDNEY: Elgin Building, Wynyard Square.

CALCUTTA 8, Mangoe Lane KIEW Besakofskaja, 7.

References to Persons in almost every Country of the World now using these Railways can be had on application.

LEEDS
PRINTED BY McCORQUODALE & CO LIMITED

The Prices and Particulars *given herein are subject to alteration without notice, and all former lists are hereby cancelled.*

The Illustrations *are subject to modification, and the dimensions may be varied slightly.*

Standard proportions and dimensions *have been adopted for the various parts, making them duplicate and interchangeable; and our clients are requested to adhere to these whenever practicable, thereby ensuring* **prompt execution of orders, accuracy, and uniformity.**

Specifications and Estimates *of all kinds of Plant will be furnished to* bona fide *enquirers free of charge.*

Correspondents are requested to give the fullest particulars and details of the work to be done, and of the circumstances under which the Railway has to be worked, so that we may advise what plant is most likely to suit them.

The cost of Packing for shipment and delivery f.o.b., for Rolling Stock, is about 2½ per cent. The price of the Railway and Plant includes what packing is necessary.

References to users in all parts of the world.

DESCRIPTIVE CATALOGUE

GREIG'S PATENT

PORTABLE & SEMI-PORTABLE RAILWAYS

AND

ROLLING STOCK.

JOHN FOWLER & CO. (LEEDS), LIMITED,

ENGINEERS,

STEAM PLOUGH WORKS, LEEDS, YORKSHIRE.

LONDON	6 LOMBARD STREET, E.C
MAGDEBURG	CENTRAL BAHNHOF
PRAG	PFLASTERGASSE 5
SYDNEY	ELGIN BUILDING, WYNYARD SQUARE
CALCUTTA	5 MANGOE LANE.
KIEW	BESAKOFSKAJA 7.

REFERENCE TO USERS IN ALL PARTS OF THE WORLD

LEEDS

PRINTED BY McCORQUODALE & CO LIMITED.

1887

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CALCUTTA	5, MANGOE LANE.
KIEW	BESAKOFSKAJA 7

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LEEDS

PRINTED BY McCORQUODALE & CO. LIMITED.

1887

GREIG'S

PATENT PORTABLE RAILWAY & ROLLING STOCK.

REPORTS AND TESTIMONIALS.

Referring to the Portable Railway and Wagons, the Rangoon Municipal Engineer says:—

"It has been invaluable in the construction of reservoir embankments, &c., for the Rangoon Water Supply."

From the Sandwich Islands:—

"The Sugar Cane Cars type J are a complete success. They have had terrible abuse at —— whilst working the traffic without an engine, and, with the exception of a broken wheel, the frames and running gear are as good as new. They have been piled up a dozen times—which would have smashed to pieces any other cars I have seen on the islands. I think them the best. They have given great satisfaction on several plantations here."

The Municipal Committee, Amritsar,

Have 5 miles of 24-in. gauge 14-lbs. Railway, and a large plant in use for the removal of town's refuse, &c. Their Engineer and Surveyor writes:—"The second consignment of 40 Wagons have been received all right, and it is likely I shall have to send you another order shortly. The Line and Wagons are much approved for the work they do for us."

Our Agent at Honolulu, reporting from a large Plantation there, says:—

"They are fully satisfied with their Tramway (20-in. gauge), and are making the full quantum of sugar by its aid. They gave me another order for a number of cars, types J and K. They say this class of car is the best they have seen for either animal or locomotive haulage."

From Sugar Plantation, Sandwich Islands—Engineer's Report:—

"My opinion about small cars and small loads is altogether in favour of using them. They are a great advantage, and the correct system. At several estates on these islands the good people have been converted from their big load idea's, and I do not see that the small cars are more expensive even in first cost. The new cars here are first-class and very strong.

N.B.—Our Railway Plant and Rolling Stock has been placed in COMPETITION with that supplied by other makers English, French, and American—and has proved itself SUPERIOR to any, its chief points of excellence being:—

ECONOMY in freight and transport up country.
ADAPTABILITY to any ground, climate, or class of traffic.
DESPATCH in laying and removal
STABILITY of the track when laid.
STRENGTH and general EFFICIENCY of the rolling stock.

EXTRACT from "THE PLANTERS' MONTHLY," September 1890.

PLANT SUPPLIED BY JOHN FOWLER & CO. (LEEDS) LIMITED.

THE ADVANTAGE OF TRAMWAYS ON SUGAR ESTATES.

In the second report, by Mr. Stanford L. Spencer, of experiments in [illegible] Louisiana, season 1887-88, forming Bulletin No. 11, Department of Agriculture, Division of Chemistry, the cost of tramways as against carts for transporting the canes to the mill. It is as follows:

THE TRAMWAY.

The economic transportation of the cane from the field to the carrier is a question of [illegible] importance. At the time Governor Warmoth purchased the Magnolia plantation the entire crop was [illegible] the mill on carts; now all the cane is delivered at the carrier on the train cars.

Mr. Dusenbar, the manager, having had considerable experience with carts and also the railway on this plant, is eminently fitted to give a comparative view of the working of both methods. The following statements have been obtained through his courtesy:—

Total length of railway, miles	4
Number of cars	169
Number of cars for track service	5
The rails are of steel, 13 pounds per yard, and the ties of corrugated steel. Gauge, feet	2
Average weight of cars, pounds	600
Average weight of load, pounds	1,500
Weight of cane per train (about), tons	110
Number of cars per train	12
Number of mules per train	2
Number of drivers per train	1
Number of trains	5
Total number of mules for trains	10
Number of trackmen	9
Number of boys with trackmen	3
Number of mules employed by trackmen	6
Number of mules for switching cars	2
Total number of mules required for the transportation of 240 tons of cane per day	17
Number of loaders	32
Number of switchmen	2
Number of boys switching cars	2
Number of men at cane carrier, day	7
Number of men at cane carrier, night	7
Total number of men and boys employed for the transportation of 240 tons of cane and delivering it to the mill, including loaders	60

TRANSPORTATION OF 240 TONS OF CANE IN CARTS.

Number of loaders	32
Number of carts	18
Number of teamsters	18
Number of mules	70
Men at carrier, day	15
Men at carrier, night	25
Yardmen	[illegible]
Total number of men	[illegible]

Items, showing monthly expenses of both systems:

(A) TRAMWAY.

2 teamsters, at $1 00	[illegible]
9 trackmen, at $1 00	[illegible]
7 boys, at 50 cents	[illegible]
2 switchmen, at $1 25	[illegible]
7 men at carrier, day, at $1 25	[illegible]
7 men at carrier, night, at $1 25	[illegible]
Total	[illegible]

(B) CARTS.

18 teamsters, at $1 00	[illegible]
18 men at works, day, at $1	[illegible]
25 men at carrier, night, at $1	[illegible]
2 yardmen, at $1 25	[illegible]
Total	[illegible]

Balance per day in favour of railway [illegible]

For season of 45 days [illegible]

Expenses for loading are the same in both cases.

COST OF RAILWAY.

Steel rails and ties, including duty	[illegible]
Cars	[illegible]
17 mules at	[illegible]
Total	[illegible]

COST OF CARTS.

18 carts, at $100	[illegible]
70 mules, at $200	[illegible]
Total	[illegible]

No mention is made in the above statements of interest on investment, since it would be about the same in either case.

The wear and tear on the mules is a large item, and is one which it is impossible to estimate. This item is small when cane is transported by rail, but is quite large when carts are used.

During a part of the rolling season the mules at Magnolia are employed in ploughing. Their work being comparatively light, they require less food than if carting cane over rough roads. Mr. Dusenbar estimates this saving of 10 pounds of oats and corn per head per day.

In Louisiana, where the cane must be harvested as rapidly as possible, economy of time is of great importance. It is estimated that the loss of time with carts in rainy weather is four times greater than with the railway. Carting in wet weather necessitates a large force of men to keep the roads in repair.

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ADAPTABILITY to *any ground, gradients or class of traffic*
DESPATCH in *laying and removal*
STABILITY of the *track when laid*
STRENGTH and *general* EFFICIENCY of the *rolling stock*

Unsolicited Testimony from Users of Steam Ploughing Machinery and Light Railway Plant for Sugar-Cane Cultivation

HAWAIIAN COMMERCIAL AND SUGAR CO.
SUPERINTENDENT'S OFFICE,
SPRECKELSVILLE, MAUI, HAWAIIAN ISLANDS,
May 28th, 1886.

D. GREIG, ESQ.,

DEAR SIR,

Your favour of March 17th to hand, and contents noted. I have this mail sent an order to Messrs. J. D. Spreckels & Bros. for another set of 16-H.P. Compound Engines, 5-Furrow Plough, 9-Tyne Cultivator, 4-Wheeled Water Cart and Hose (complete), with a lot of extras, &c, &c.

We are now on a field that is a great deal worse than the one we were at work at when you were here.

We have just finished grinding the cane from that rocky field we were ploughing when you were here, and it has made 6 tons of Sugar per acre; 450 acres in the field. The first crop in same field, in virgin soil, scratched over with a bullock team, only went $4\frac{5}{6}$ tons per acre. All our Plant Cane this crop, 1,600 acres, has averaged over 5 tons per acre. We hauled one field 846 acres (10½-miles), and made 105 tons of Sugar per day, grinding 10 hours, with three mills. I expect to finish this crop in four weeks from now, and it will be 14,000 tons, as we plough, plant, cultivate, and raise all the Cane, I think this is the biggest crop in the world. Will you let me know if there is any other Plantation that can come up to it?

Please send the new Ploughs as soon as you can, as I want to get them at work.

Yours truly,

GEO. C. WILLIAMS.

SUMMARY OF MACHINERY SUPPLIED TO THE ABOVE CLIENTS SINCE 1880.

6 miles Portable Railway, 24 in. gauge, with Equipment and Rolling Stock.

34½ miles Permanent Railway, 24 in. gauge, and 200 Cane Wagons.

2 Locomotives, Nos. 4,181 and 4,184, for 24 in. gauge track.

1 16-H.P. Compound Set of Ploughing Tackle, Nos. 4,291-2, double system.

1 18-H.P. Single Set of Ploughing Tackle, Nos. 4,606-7, double system.

COPY OF THE OFFICIAL REPORT from the Secretary of the Amritsar Municipality (North West Province of India).

THE Tramway, or more correctly speaking, the Portable Railway, imported by the Municipality of Amritsar, is so highly thought of by those who have seen it work that it has been suggested to me to put together some notes of the amount of work done by it, the cost of such work compared with the cost of doing similar work by the ordinary means of hand, and any other particulars might be useful to any person interested in improvements of public character.

In 1882, the Municipality, at my suggestion, decided upon introducing the Trai... the purpose of removing rapidly the sweepings of the city. In April, 1882, having occasi... to England I was deputed to arrange for the purchase.

In October the material arrived in Amritsar, and by the 14th December the five miles of lin... were laid. Of these, only two miles were opened for Conservancy work, the remaining three miles, with a proportion of rolling stock, were utilised in conveying earth to fill up the city ditch... Committee considered the work on the ditch of pressing importance as affecting the health of the city.

The line is two-feet gauge. The rails are steel, 14 lb. to the yard, supported on corrugated steel sleepers. By a simple system of clutch bolts the gauge is maintained in whatever position the line is laid. The rails, being made in fifteen-feet lengths, can be carried from place to place, re-laid, and linked in by ordinary coolies; no skilled labour being necessary.

There are other advantages which cannot be estimated in money. They are:—(1) Rapid removal of the filth from the city; (2) No deposits are left on the line or road, as is the case when donkeys are employed—their line of route could be distinctly traced, and felt too, by droppings from the bags or panniers; (3) Another and a very important advantage is, that you have always at hand a ready means of getting rid of earth, or other matter from places where carts could not be employed. During the year, the sludge from two tanks (the Durgiana and Koulsur) was removed in a very short space of time during the hottest part of the year, and the earth excavated from two tanks on the cattle-fair site was utilised in filling up hollows, thereby reclaiming valuable land.

The Sanitary Commissioner with the Government of India, the Surgeon-General of the Punjab, the Sanitary Commissioner of the Punjab, the Commissioner of the Amritsar Division, and, in fact, all who have seen the system at work have expressed approval of it.

On the Conservancy lines horses are used. One horse draws five wagons and does the work of twenty-five donkeys; on the city ditch lines the wagons are propelled by coolies.

E. NICHOLL,

Secretary, Municipal Committee.

19th November, 1883.

DEPUTY COMMISSIONER'S REPORT.

(1.) I have never seen in any Municipality such efficient means to remove city sweepings away as are in force at Amritsar; these are so successful, and have been so much appreciated, that I asked Mr. Nicholl, the Secretary of the Municipal Committee, to draw up a Memorandum giving some description as to the working of the Portable Railway or Tramway.

(2.) At present the Tramway is working on only one side of the city; by degrees it will duly be laid all round. The inside sweepings are brought to certain station at the city wall in baskets, wheelbarrows, and carts, and there deposited into small iron wagons—each wagon holding ten donkey-loads; the wagons are all linked together, the driver on horseback trots away with five wagons at a time to the place a mile and more away, where the refuse is collected and sold for a considerable amount. The wagons, specially made for the purpose, run on a line of rails. The loads are deposited in the wagons near the city by the Conservancy establishment, and are easily emptied at the place where the refuse is collected, by being tilted over.

(3.) To carry out this work by the ordinary means of Conservancy carts, donkeys, or labourers would be more costly, troublesome, tedious, and less effective.

(4.) Another great advantage of this Portable Railway is that material for filling in low grounds and swamps can be brought from a distance with little cost, and the wagons have been thus utilised here. In the outward trip city refuse has been taken away, and in the return trip thousands of cubic feet of earth have been brought in to fill up the low grounds round the city.

(5.) The line of rail is easily put down and removed, and can therefore be utilised with economy and advantage anywhere. A large tank was lately dug out at the site of the cattle fair, and in an incredibly short time all the earth was removed to fill up low places in the adjacent grounds, by means of this Portable Railway.

(6.) Mr. Nicholl deserves all the credit for introducing this simple and effective means of permanently improving the Conservancy arrangements: the clearance is very effective, for the refuse is removed a long way off from the city, all causes of nausea and ill-health, arising from accumulated rubbish in the precincts of the city are removed.

(7.) I have thought it advisable to make these remarks for perusal of the Sanitary Commissioner and anyone interested in improved Conservancy, and may be excused for suggesting simply "*pro bono publico*," that a hint to other Municipalities might induce them to invite Mr. Nicholl to give them the advantage of his knowledge and experience, which he is well able and willing to afford if asked.

G. KNOX,

Deputy Commissioner.

19th November, 1883.

33

INTRODUCTION.

We have much pleasure in submitting to our clients the following revised Catalogue of **Light Railways** and **Rolling Stock.**

The attention we have paid to developing this branch of our manufactures has led to its adoption in a variety of industries, and our Portable Railway and Rolling Stock is now working successfully in nearly **every country in the world.**

For **newly-settled countries** this Railway is specially adapted It can be laid down for less than the cost of constructing roads, and by unskilled labour ; and, while the cost of keeping the roads in repair is a constant burden on the inhabitants, the Railway may be maintained in working order comparatively free of cost, as it is not injured by floods or heavy rains.

As **feeders** to main lines of railway, or for **"Pioneer"** lines, this Railway is specially valuable, the increased value of the land in the district through which the line passes often more than compensates for the cost As a "Pioneer" line, its portability allows of its being **easily moved** further ahead when the district it has served is sufficiently settled to warrant the extension of a main line of railway to take its place.

An objection may be raised to the use of these light railways in connection with main lines, on account of the break of gauge. But as the **economy of light railways** consists, not in their superseding main lines, but in their **adoption in the place of cart roads,** the objection is at once removed It will be clear to our clients that the cost of transferring from the small wagons to main line trucks will be no greater than if the material had to be taken from carts or wagons. For certain classes of goods, however, arrangements can be made by which the bodies of several small wagons may be placed on one large truck without in any way disturbing the contents, or the Pioneer line can be raised above the main line trucks, and the contents tipped from one into the other

Our experience in the **export trade** is very extensive, and merchants and shippers may rely on careful packing, and on such instructions being sent out as will enable any ordinary workman to put the machinery together at its destination

JOHN FOWLER & CO. (LEEDS), LIMITED.

STEAM PLOUGH AND LOCOMOTIVE WORKS
LEEDS

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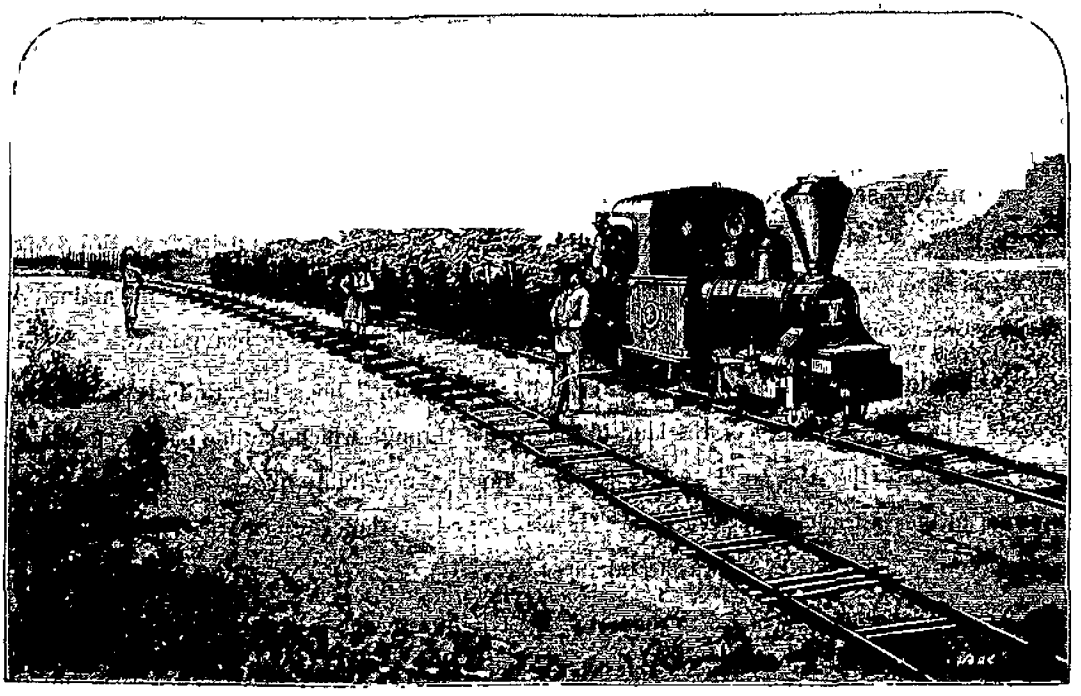
DESCRIPTION
OF THE
PORTABLE AND PIONEER RAILWAYS.
(GREIG'S PATENT.)



THE **principle** on which this system of Railway is constructed is that of **distributing loads** upon a large number of wheels, and avoiding the use of heavy and cumbersome plant. The material to be removed is, whenever possible, divided into loads weighing from 10 cwts. to 20 cwts., and carried on small wagons. As far as possible the loads, the Railway, and the Rolling Stock, are so proportioned that they can be lifted and removed by one or two men without the aid of any mechanical appliances.

Where the material to be carried is of such a nature that it cannot be divided, or is too bulky for the small wagons, these are used as **swivelling bogies,** and carry bodies or platforms of a form and size to suit the load to be carried. In this way the **heaviest articles** may be transported without injuring a light and carelessly laid line, and passed freely round curves of small radius.

The great superiority of Greig's Patent Railway consists in the manner in which the rails are secured to the sleepers and in the peculiar form of the sleeper itself. The sleeper is rolled of **steel** with a deep corrugation down the centre, thus combining **strength** and **lightness.** The rails are rigidly secured to the sleepers by **steel chairs** (riveted by hydraulic power to the sleeper) and hook-headed bolts. By this fastening the use of rivets (always a source of weakness) is dispensed with, and the sleeper is not weakened by clips being punched out of it, or by holes made in it to hold the rail or rail fasteners.

The success of a **Portable Railway** depends on the following points being adhered to:—

1st.—The **maximum of strength** being combined with the **minimum of weight.**

2nd.—That the different pieces of the Railway (*i.e.*, straight sections, curved sections, crossings, &c.) are all **interchangeable and portable by one or two men.**

3rd.—That the fastening of the rails to the sleepers shall not weaken either rail or sleeper at the point where the attachment is made, and be of such strength that it **cannot be broken by carts or wagons** crossing the line.

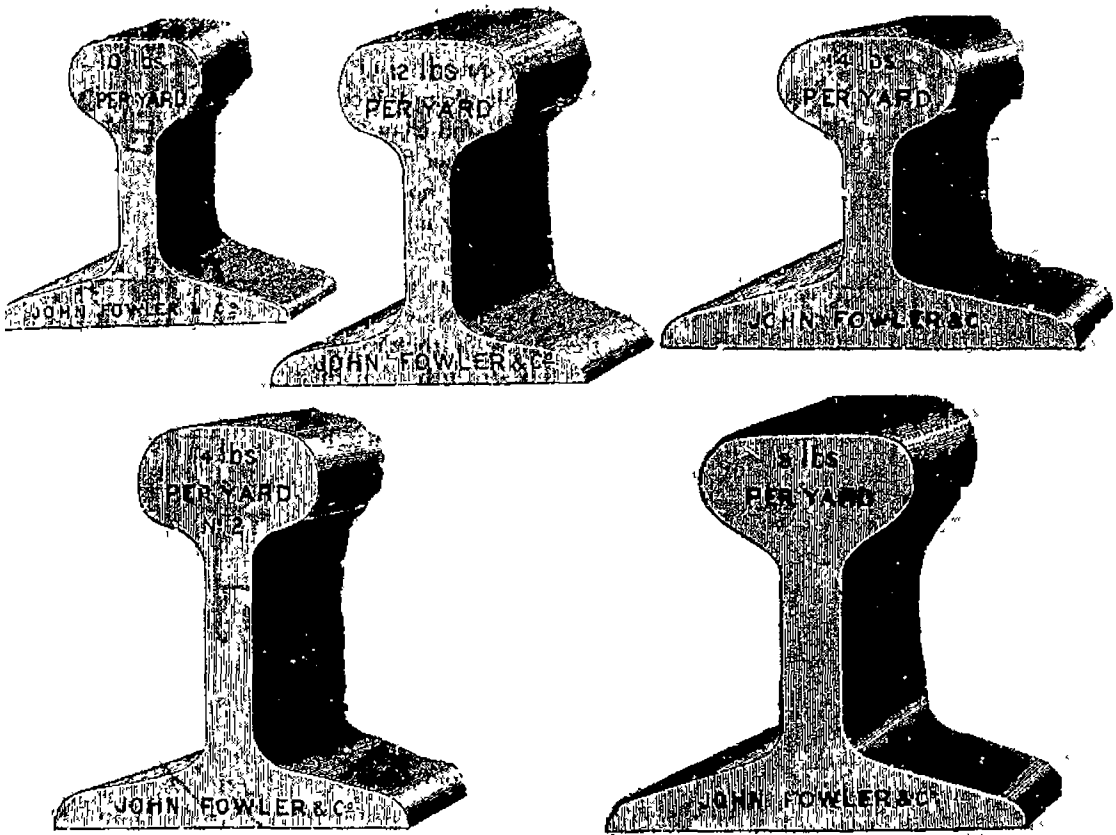
4th.—That **no loose parts** are necessary for laying the line in the fields.

5th.—That the gauge be such that the first and second points can be adhered to.

6th.—That the construction of the Railway be such that **no skilled labour is required** to lay it down.

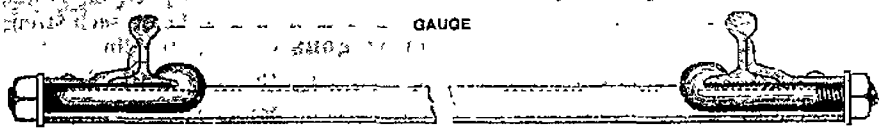
From the following Explanation and Diagrams it will be seen that **our Railway Plant contains every point** necessary to ensure successful working:—

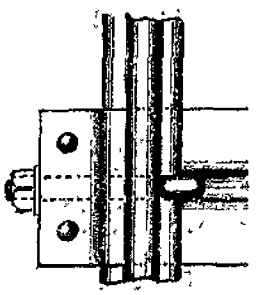
1st.—The **SECTIONS** of rail shown have been chosen as most suitable for the different classes of railway.



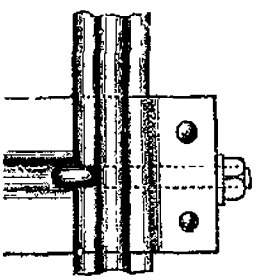
These **rails** are of **steel** with a high degree of strength and elasticity, and give ample bearing surface on the ground, at the same time are not too heavy. (Iron rails are found not to answer.) They are rigidly secured to corrugated **steel sleepers** of different thickness and section, according to the weight of the rail used and the loads to be carried. The **corrugation** adds greatly to the strength, with comparatively little increase of weight. One of these sleepers, $\frac{1}{8}$th in. thick, will bear the weight of a loaded wagon or cart crossing it without bending.

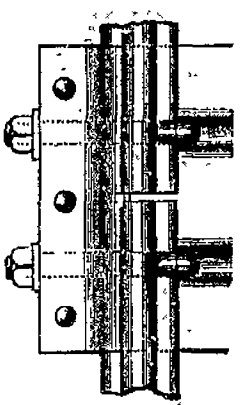
2nd.—The **straight** and **curved sections, crossings,** &c., are of such lengths that if one piece is taken up any other piece can be laid down in its place without disturbing the rest of the line. In making **pass-bys** (*see fig.* 12, *page* 28), however, a few special lengths may have to be used. These are always the same, and instructions are given for their use to suit the circumstances in which they are required.

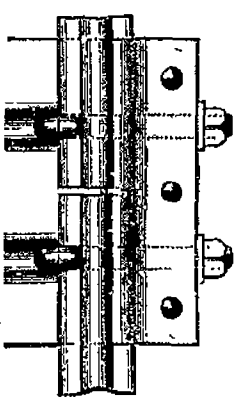




3rd.—**Greig's patent fastening** is made by **hook-head bolts** (called clutch bolts) and **steel chairs,** which are rolled of suitable section to fit over the flange and against the rail, thus supporting it from base to head. The chairs are riveted by hydraulic power to the sleepers, at the correct distance apart for the gauge required; and by passing the clutch bolt along the corrugation under the rail and chair, and tightening the nut, the inner flange of the rail is gripped by the hook-head and the rail is **held firmly** under and against the chair (*see illustration*). By this method the sleepers can easily be moved closer together or wider apart, according to the nature of the ground or traffic. The full strength of both rail and sleepers is maintained, and it is practically **impossible to disturb or break the attachment.**

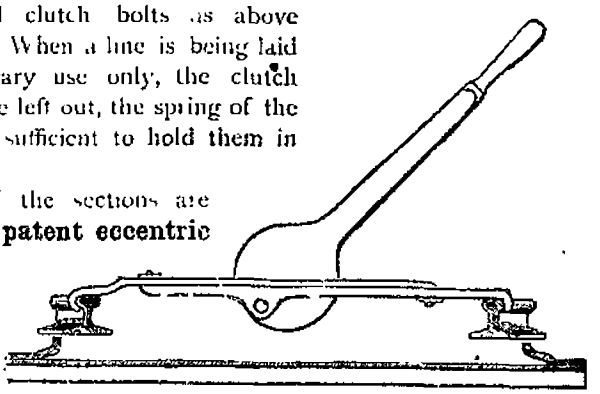






4th.—The sections in Greig's railway are joined together by **double corrugated sleepers,** one of which is placed at the end of each section, the jointing being effected by riveted chairs and clutch bolts as above described. When a line is being laid for temporary use only, the clutch bolts can be left out, the spring of the rails being sufficient to hold them in the chairs.

The rails at the open ends of the sections are usually drawn together by means of **patent eccentric lever tongs,** so that they will drop on the double sleeper; when released, the rails spring into the chairs and the joint is made.



The **JOINTS** may also be made, if preferred, by two fish plates riveted to the end of one rail, and sole plate riveted at the opposite end; the rails therefore, dove-tail together, and are supported by the sole plate, the fish plates keeping the ends fair.

5th.—The **GAUGES** adopted for portable lines are **16, 18, 20, 24,** and **30 inches.** Each of these have advantages according to the purpose for which the line is used and the tractive power employed. The 16, 18, and 20-inch gauge are preferable where manual power is used and the loads are light and compact; the 20 and 24-inch is best suited for animal power; and, the 24 and 30-inch gauge may be adopted for locomotive power. The 30-inch gauge is the widest which permits the principles of our system of Portable Railway being effectually and conveniently carried out.

In adopting these gauges the chief points considered are **strength, lightness** and **easy portability.**

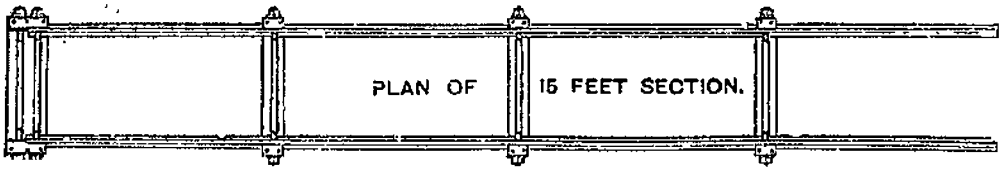
6th.—From the foregoing description it is hardly necessary to point out that a line can be laid down, worked, and removed **without the aid of skilled labour.** To give some idea of the facility with which it can be handled (in clearing land of sugar canes and similar operations)—four men have taken up 250 yards of railway and relaid it fifty yards away in **twenty minutes,** and re-connected the temporary line with the main line to the sugar mill.

Finally, this Railway combines in the most complete manner all the essentials of **perfect Portable Railway,** and in addition it **can be taken to pieces** for convenience of packing and economy in shipment and transport, thus **reducing the cost of freight by at least one-half,** and having arrived at its destination it can be put together by any coolie or farm labourer.

STANDARD SYSTEMS OF PORTABLE RAILWAYS.

For convenience of reference we have divided our Portable Railways into classes, viz.:—

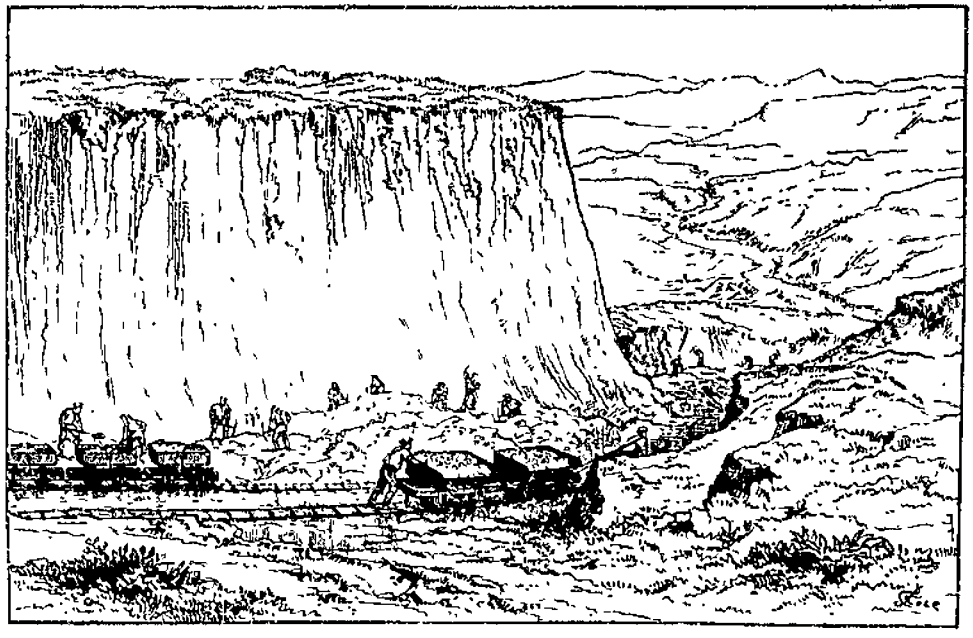
SYSTEM A.—Constructed with rails weighing **10, 12,** and **14 lbs.** per yard (chiefly in lengths of 15 ft.), and patent corrugated steel sleepers and chairs, spaced 3 feet 9 in. from centre to centre, and recommended for manual or animal power.



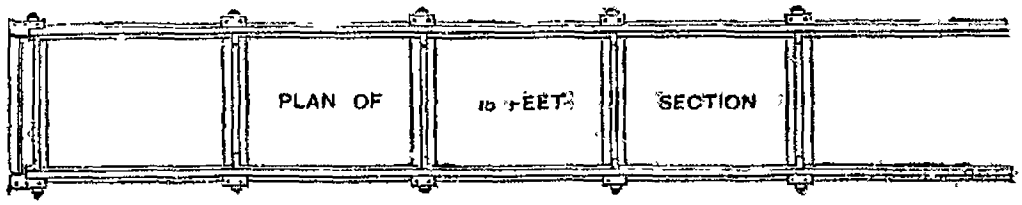
Length of this Railway now in use, 560 miles.

This system, with 10-lb. rails, should be chosen when intended to be worked by manual power, with wagons carrying 10 to 15 cwts. It is specially suited for **contractors' light work,** also for **workshops, warehouses,** and **farm buildings.** It is used largely in Java and India on **sugar, indigo,** and **tea plantations.** The gauge recommended is 18 in. or 20 in.

With 12 or 14-lb. rails this system may be adopted when intended to be worked by animal power, with wagons carrying 15 to 20 cwts. It is largely used by contractors for **heavy jobs,** also in **brickyards** and **workshops,** and on **sugar estates, plantations,** and **forest clearings,** where mules, horses, or bullocks are employed. A large mileage is being worked in the United States, Hawaiian Islands, Australia, New Zealand, Java, Philippine Islands, India, Ceylon, China, Spain, and in the United Kingdom. The gauge recommended is 20 in. or 24 in.



SYSTEM B.—Constructed with rails weighing **14 lbs.** and **18 lbs.** per yard chiefly in lengths of 15 ft.), and patent corrugated steel sleepers and chairs of extra strength, spaced 3 ft. from centre to centre, and recommended for animal or light locomotive power.

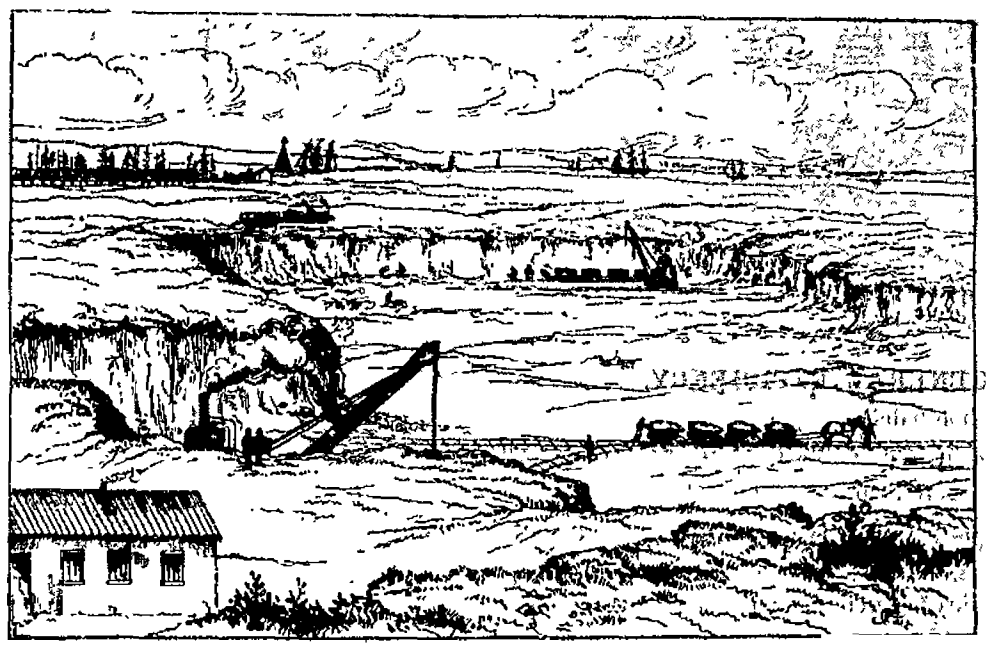


Length of this Railway now in use, 300 miles.

This line is heavier and stronger than System A, though generally of the same construction. With 14-lb. rails it should be chosen when the ground over which it is laid is soft or very uneven, and when the loads weigh from 20 to 25 cwt. It is principally used on **sugar plantations** and for **clearing forests.** The best gauge is 24 in.

When 18-lb. rails are used, and the track carefully laid, this system can be used for light locomotives; it is often employed in conjunction with the lighter lines before described, for those portions of the railway **where the traffic is heaviest,** and which do not require frequent removals.

It is largely used in Australia for sugar plantations and for clearing timber, also in Java and Hawaiian Islands; it makes a good line for **passenger traffic** and for **military purposes.** The gauge usually adopted is 24 in.



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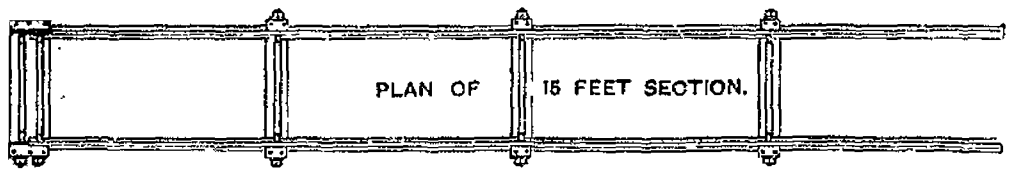

Length of this Railway now in use, 550 miles.

This system, with 10-lb. rails, should be chosen when intended to be worked by manual power, with wagons carrying 10 to 15 cwts. It is specially suited for **contractors' light work,** also for **workshops, warehouses,** and **farm buildings.** It is used largely in Java and India on **sugar, indigo,** and **tea plantations.** The gauge recommended is 18 in. or 20 in.

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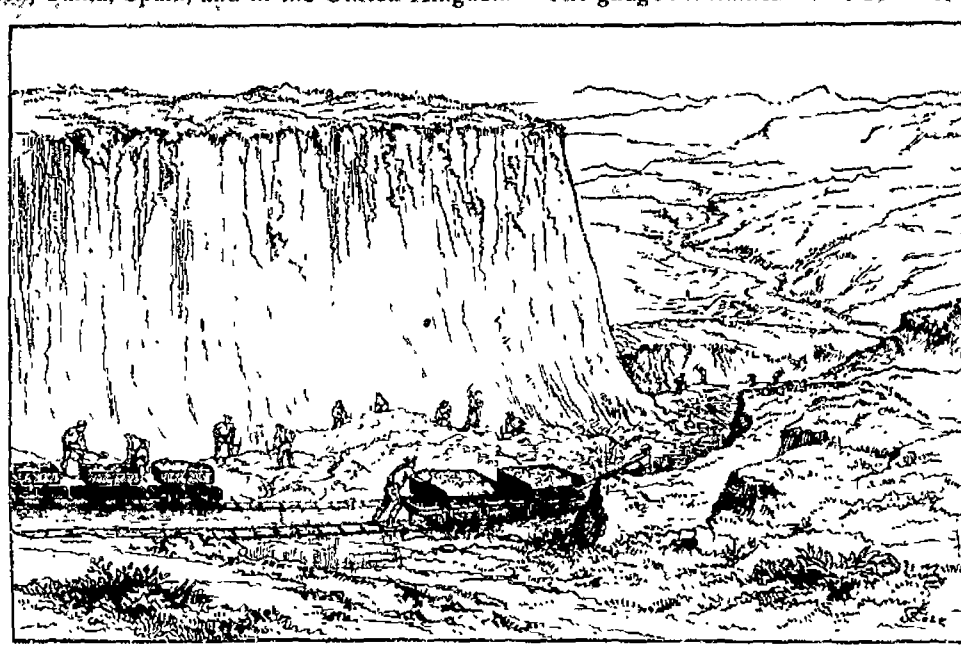
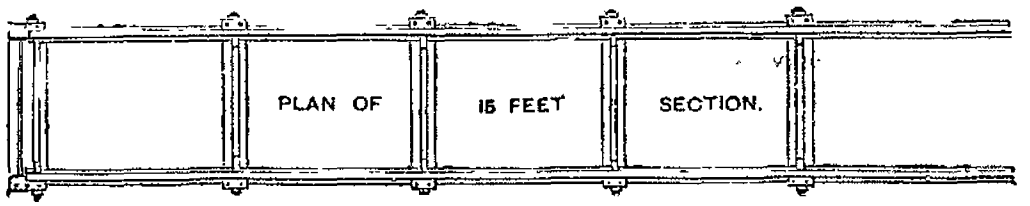


SYSTEM B.—Constructed with rails weighing **14 lbs.** and **18 lbs.** per yard (chiefly in lengths of 15 ft.), and patent corrugated steel sleepers and chairs of extra strength, spaced 3 ft. from centre to centre, and recommended for animal or light locomotive power.

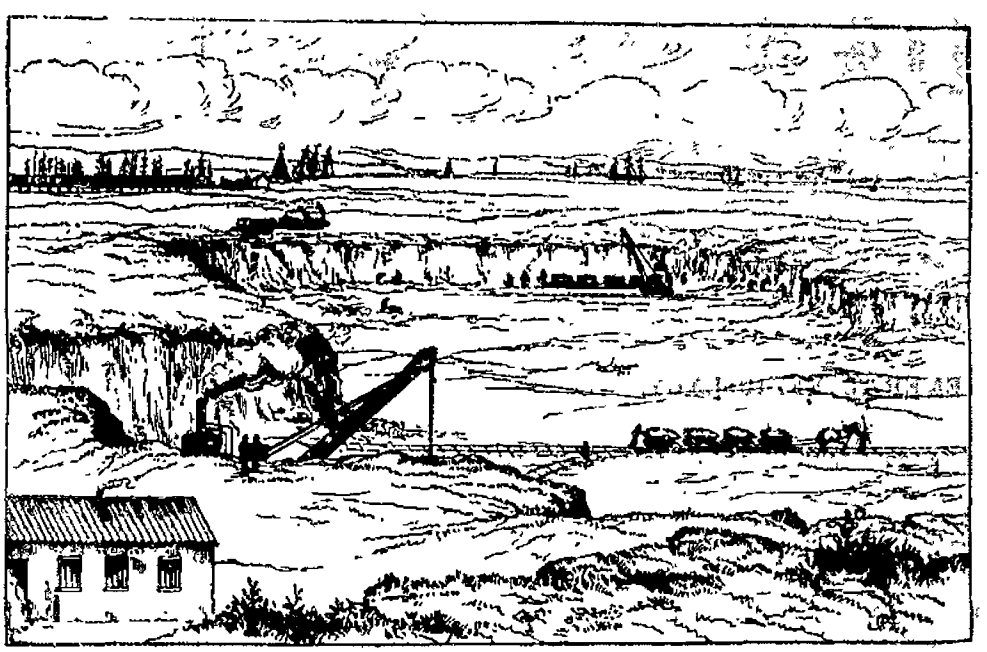


Length of this Railway now in use, 300 miles.

This line is heavier and stronger than System A, though generally of the same construction. With 14-lb. rails it should be chosen when the ground over which it is laid is soft or very uneven, and when the loads weigh from 20 to 25 cwt. It is principally used on **sugar plantations** and for **clearing forests.** The usual gauge is 24 in.

When 18-lb. rails are used, and the track carefully laid, this system can be used for light locomotives; it is often employed in conjunction with the lighter lines before described, for those portions of the railway **where the traffic is heaviest,** and which do not require frequent removals.

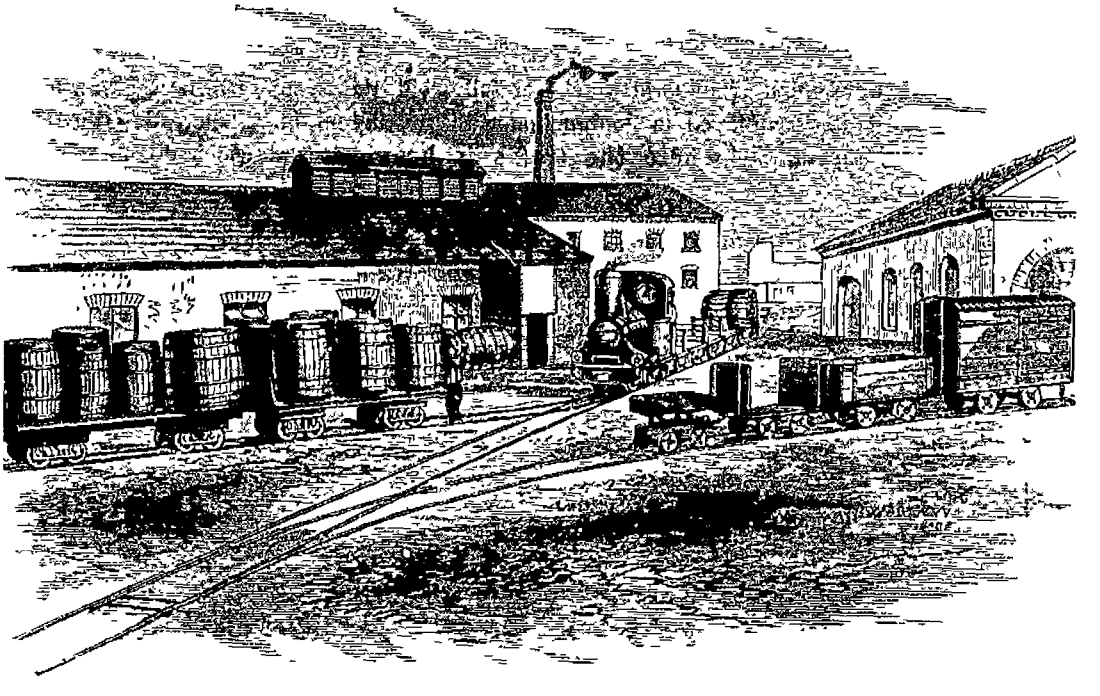
It is largely used in Australia for sugar plantations and for clearing timber, also in Java and Hawaiian Islands; it makes a good line for **passenger traffic** and for **military purposes.** The gauge usually adopted is 24 in.



SYSTEM C1.—Constructed with rails weighing **18 lbs.** and **20 lbs.** per yard (chiefly in lengths of 15 ft.), and patent corrugated steel sleepers and chairs, spaced 3 ft. from centre to centre, and projecting beyond the gauge 6 in. at each end; suitable for **light locomotive traffic.**

This line is the **heaviest** that can be conveniently handled and used as a Portable line; it can be strongly recommended for **rough ground,** and even if carelessly laid will admit of a locomotive working on it; having large bearing surfaces, it is **very suitable for soft, loose, or sandy land.**

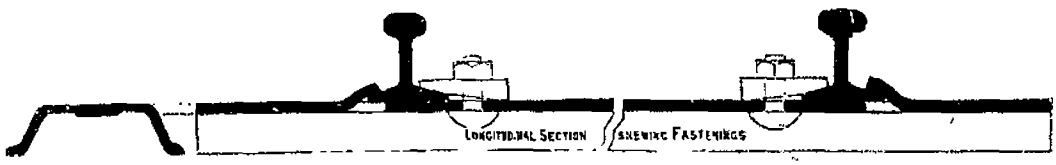
It is often used in conjunction with the lighter lines for the more permanent portions of the Railway, and has been largely adopted for **heavy timber clearings, mining operations,** and **chemical works.** The best gauge is 24 in.



GENERAL EFFICIENCY.—The great superiority of Greig's System will be found (**a**) in its non-liability to get out of order, (**b**) in the mode of connection between rails and sleepers, and (**c**) in the simplicity of the rail joints. The sections of railway can be built and laid by any labourer, our great object having always been to avoid the necessity of skilled labour. The rails, sleepers, and fastenings are coated in oil (before leaving the works) to prevent corrosion, and all the parts are of the most substantial kind, combining lightness with strength and durability. Intending purchasers of light railway plant will do well to place their orders with us, as our various designs are the outgrowth of an extensive practical experience.

From our long experience in the making and working of Portable Railways, we are strongly of opinion that **Greig's patent sleepers and fastenings make the best light railway,** and give many advantages in working not gained in any other system; in consequence, however, of the extra quality of the materials required, its first cost is a little above the price of some.

To meet this competition we are manufacturing **cheaper systems,** with steel sleepers of inverted trough section, the rail held on the outside by a lip punched up out of the sleeper, and on the inside by a pinch-plate, bolt and nut. (*See following illustration.*)

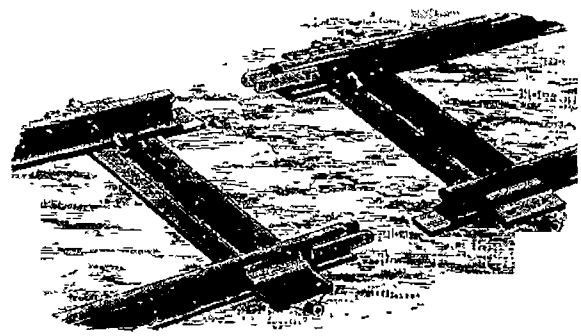


SYSTEM AA.—Constructed with rails weighing **10 lbs., 12 lbs.,** and **14 lbs.** per yard, (chiefly in lengths of 15 ft.), with the requisite fish-plates and bolts for joints, and trough section steel sleepers, spaced 3 ft. 9 in. from centre to centre, each projecting 4½ inches beyond the gauge line.

This system may be used for the work indicated for System A, on page 12.

SYSTEM CC.—Constructed with rails weighing **18 lbs.** and **20 lbs.** per yard (chiefly in lengths of 15 ft.), with the requisite fish-plates and bolts for joints, and trough section steel sleepers, spaced 3 ft. from centre to centre, each projecting 6 in. beyond the gauge line.

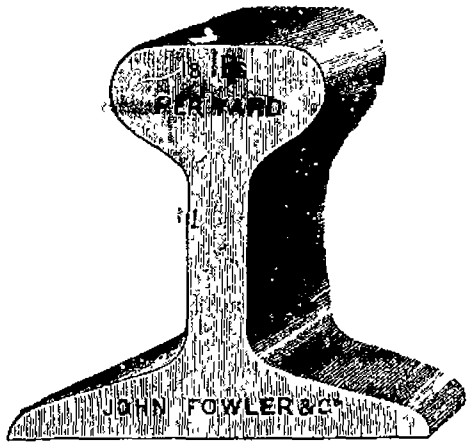
This system may be used for the work indicated for System B (*see page* 13) and System C 1 (*see page* 14).

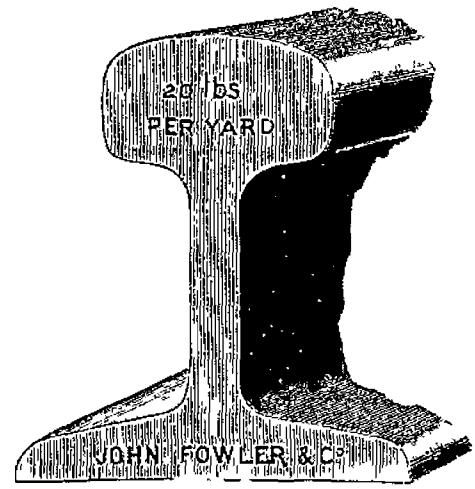


NOTE.—The above systems **AA** and **CC** can be supplied, if preferred, with riveted fish plates and sole plates for the joints (*see illustration*), thus making a very good Portable Railway.

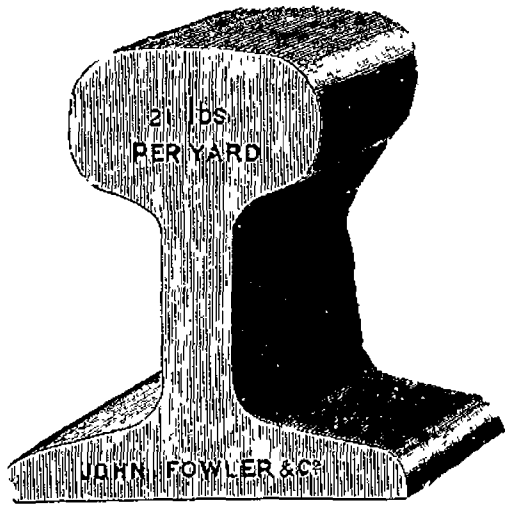
SEMI PORTABLE AND PIONEER LINES,
OR
PERMANENT STEEL RAILWAYS.

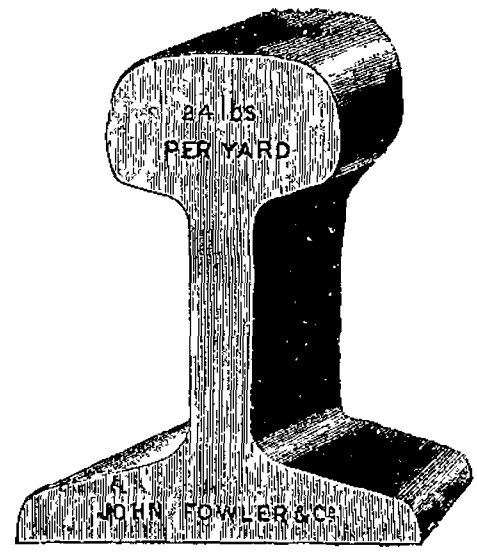
FROM experience gained in applying the system of Portable Railways described in the preceding pages, we have found that in most places certain portions of the line never have to be removed, as they form a main line, and are fed by the portable branches, which are



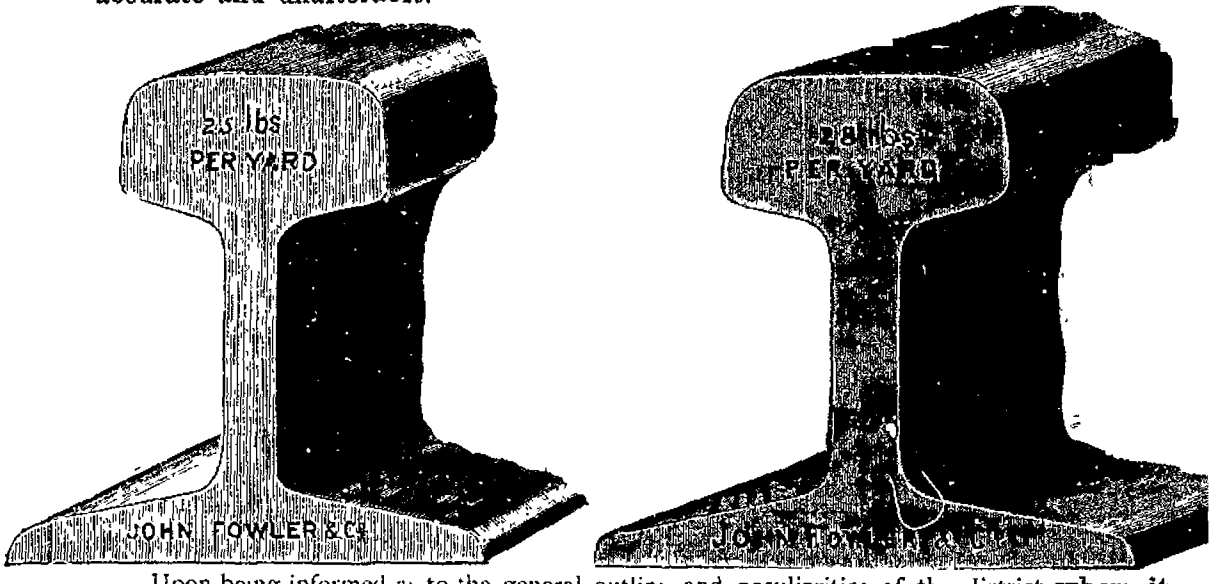


constantly being shifted. For these portions of the railway a **more permanent and heavier line** can be used with advantage, and this type of line is best suited for the **Pioneer Lines**, mentioned in the Introduction to this Catalogue (*see page 7*).

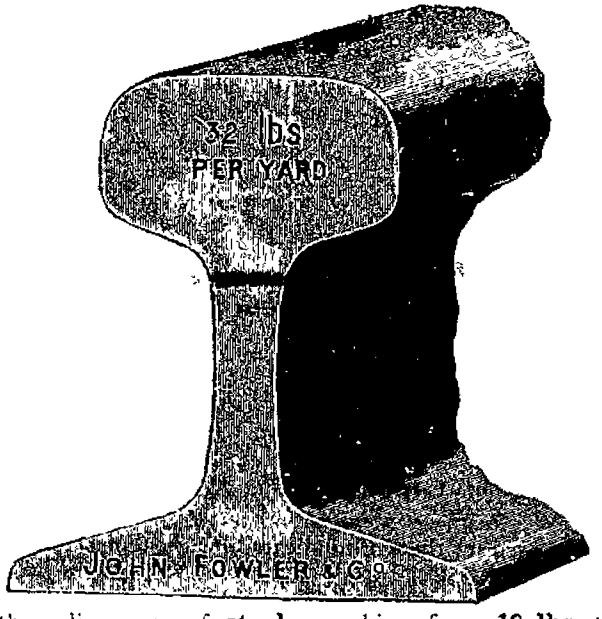




On a narrow gauge Light Railway, the chief difficulty is **keeping the track true in gauge,** in consequence of the action of the weather on wooden sleepers and dog-spikes. Our steel sleepers and fastenings entirely remove this difficulty, the rails are placed in their position, the bolts tightened up, and the gauge of the Railway is at once **accurate and unalterable.**



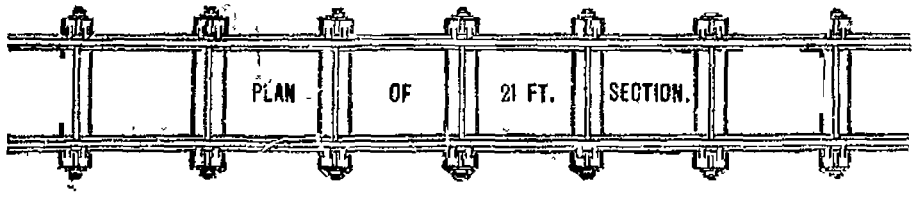
Upon being informed as to the general outline and peculiarities of the district **where it is proposed to lay down a Railway,** the nature of the traffic to be worked, and (if possible) a sketch plan showing the intended arrangement of the line, we shall be pleased to recommend such plant as has been found most suitable under similar conditions elsewhere; also to submit specifications and estimates.



The Rails for these lines are of **steel,** weighing from **18 lbs.** to **32 lbs.** per yard *(see sections above)*

For convenience of reference we divide them into Classes, viz.: -

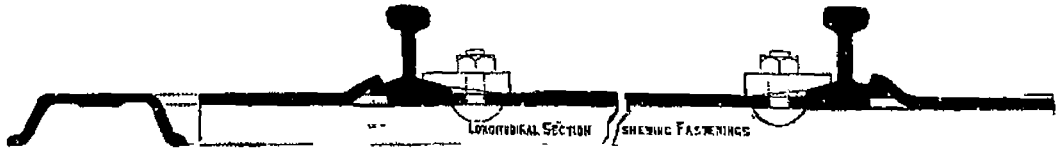
SYSTEM D 1.—Constructed with rails weighing 21 lbs. and 24 lbs. per yard (chiefly in lengths of 21 ft.), and patent corrugated and flanged steel sleepers, with double tongues pressed from the sleeper bar to form the chairs. The joints of the rails are made by ordinary fish plates and bolts, and the sleepers are spaced 3 ft. apart from centre to centre, each projecting 7½ in beyond the gauge at each side. The section of the sleeper is same as used for System D, but instead of chairs being riveted on the sleeper, tongues are punched up, to suit the foot of the rail, and the fastening is completed by the clutch bolt and nut before described (*see page* 10), or by an inside tongue and wedge.



This railway is somewhat **cheaper than System D,** but can be equally recommended as **a lighter permanent line.**

The best gauges are 24 in. and 30 in.

SYSTEM DD.—This is a cheaper system of Semi-Portable or Permanent Line, of the same construction as described on page 15.

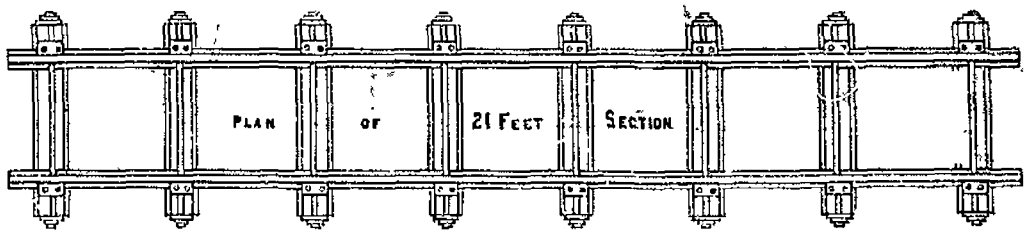


It is constructed with rails weighing 18 lbs., 21 lbs., and 24 lbs. per yard (chiefly in lengths of 21 feet), with the requisite fish-plates and bolts for joints and trough section steel sleepers spaced 3 ft. centres apart, each projecting 7½ in. beyond the gauge line.

This System may be used for the work indicated for System D (*see following page*).

SYSTEM D.—Constructed with rails weighing 24 lbs. and 28 lbs. per yard (chiefly in lengths of 21 ft.), and patent corrugated and flanged steel sleepers and chairs. The jointing of the rails is effected by ordinary fish plates and bolts, and the sleepers are spaced (say 2 ft. 9 in. from centre to centre, each sleeper projecting 7½ in. beyond the gauge at each side.

The section of the sleeper is of such form that they **will bed themselves** firmly in the ground. Being 6 in. wide, ample bearing surface is gained, also **great strength and stability** of the track. This system **is unequalled as a Light Permanent Railway** and is specially suitable for locomotive traffic.



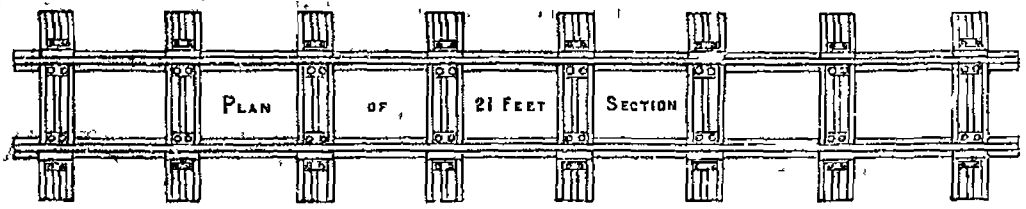
Length of this Railway now in use, 260 miles.

The Indian Government have adopted this system for local lines and feeder lines to the States Railways, and several officials and engineers have expressed their unqualified approval of it. Amongst the lines we have supplied may be named the Cherrapoonji Mountain Tramways, Companygunj and Therriaghat, and Jorhat Branch Railways.

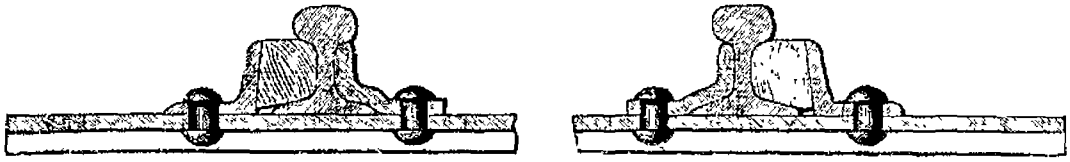
The best gauge is 30 in., but the system will give equal satisfaction from 24 in. to metre gauge.

In giving orders for Light Railways and Plant, customers are urged to **adhere to our standard systems,** as by so doing, they may ensure **prompt execution of orders** however large, and may look forward to receiving the **best and most useful plant**

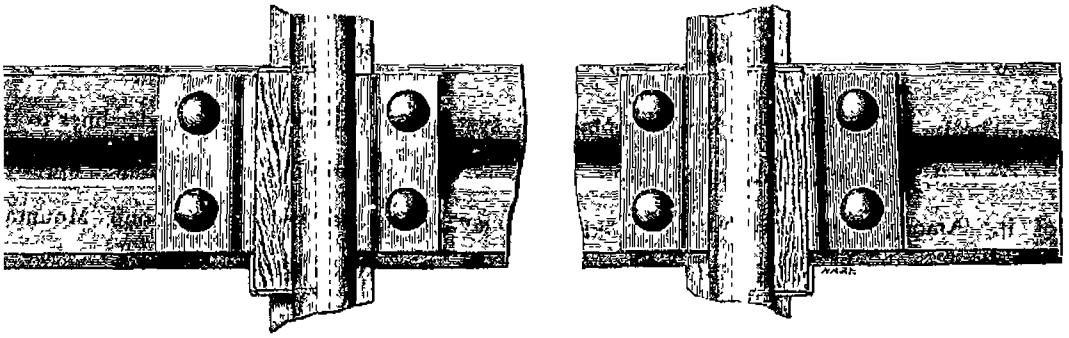
SYSTEM E.—Constructed with rails weighing 24 lbs. to 32 lbs. per yard (chiefly in lengths of 21 ft.), and patent corrugated and flanged steel sleepers. The jointing of the rails is effected by ordinary fish plates and bolts, and the sleepers are spaced (say) 2 ft. 9 in. apart from centre to centre, and each projects 9 in. beyond the gauge at each side. The section is similar to Systems D and D1, 6 in. wide; but the additional length of sleeper makes this a more permanent line, **especially suitable for loose or sandy land.**



We have already about 80 miles of this Railway in use; it has been adopted by **H.M. Government** for military purposes. In the late **Egyptian Campaign** 15 miles were contracted to be laid in the Soudan in connection with the Suakim-Berber Railway. The fastening of the rail to the sleeper is by hardwood keys, as shown in the illustrations to



These engravings show section and plan of the corrugated and flanged sleepers, with the rails, chairs, and keys in position, as when ready for working.



The gauge adopted by the War authorities was 18 in. The system may be used up to metre gauge.

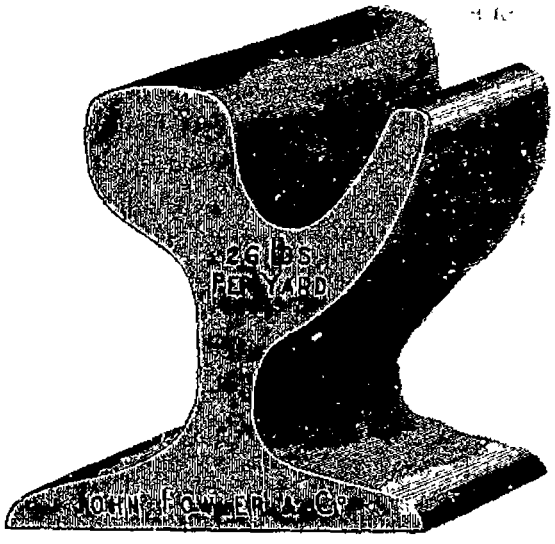
SYSTEM F. Is also constructed with rails weighing 24 lbs. to 32 lbs. per yard (chiefly in lengths of 21 ft.) and patent wrought-steel dished and flanged-steel sleepers of special form, **designed specially for soft and loose swampy land**, the joints of the rails are made by ordinary fish plate and bolts, and the sleepers are spaced 2 ft. 9 in. apart from centre to centre. These sleepers are pressed from steel plates 9 in. and 10 in. wide, from $\frac{1}{4}$ in. to $\frac{5}{16}$ in. thick and 1 ft. 9 in. longer than the gauge of the line and by this means a wide deep flange is formed at each end to give large bearing area, and also to hold the ballast firmly under the sleeper.

Although this is a somewhat more costly line at first sight than the systems before described, it will be an **economical investment,** especially for **marshy countries,** as its maintenance will cost comparatively nothing.

This system may be strongly advocated for all gauges, from 24 in. to metre.

PATENT STREET TRAMWAYS,

WITH GROOVE-HEADED RAILS FOR LAYING IN PUBLIC ROADS, &c.



This Tramway is designed to work in conjunction with our Portable and Semi-portable Railways, also for **light traffic in streets,** and for **Wharfs, Warehouses, &c.**

All crossings are self-contained, ready for laying.

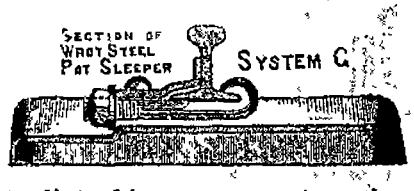
Street Tramways, with rails up to 60 lbs. per yard, quoted for on receipt of particulars.

As the details vary according to the gauge, weight of rails, and the general circumstances and special requirements of each line, we do not purpose offering any descriptions here, but shall have pleasure at any time in **furnishing specifications, drawings, and estimates** for any **street tramways,** and all necessary **plant and rolling stock,** upon receiving the necessary information as to the nature of traffic and other circumstances bearing on the proposed line.

The 26-lb. Tram Rail shown above has been designed for narrow gauge lines in the streets of Hong-Kong. It is intended only for light traffic, but will in many cases **serve as well as a heavier section.** The sleepers to be used with it are the same as described for System D1 (*see page 18*). The joints of the rails made by Double Corrugated Sleepers.

PATENT WROUGHT-STEEL CIRCULAR POT SLEEPERS,

For LIGHT RAILWAYS, for use on loose land, and for outer rails of curves, &c.—SYSTEM G.



THESE are made 12 in. diameter, for 10-lbs to 21-lbs. rails; and 15 in. diameter, for 18-lbs. to 32-lbs rails. Pressed out of steel plates from $\frac{1}{8}$th to $\frac{3}{16}$th in. thick, and fitted with riveted chairs and clutch bolts.

These sleepers can be placed in our lines **without disturbing any parts**: they are called for when the roadway is swampy or sandy for short distances, in which case these sleepers may be bolted immediately to the rails between the transverse sleepers, thus adding to the strength and stability of the track. The circular form **cannot be excelled** for holding in loose sandy ballast.

LIGHT PERMANENT LINES,

WITH WOOD SLEEPERS.

If wood sleepers are adopted great care should be used in selecting them, as they may prove a source of continual annoyance and expense, especially where timber is subject to destruction from weather, insects, &c. Where sound timber can be obtained to withstand the decaying influences to which they are exposed, a proportion of wood sleepers may be used, although they are certain in the long run to prove a dear investment.

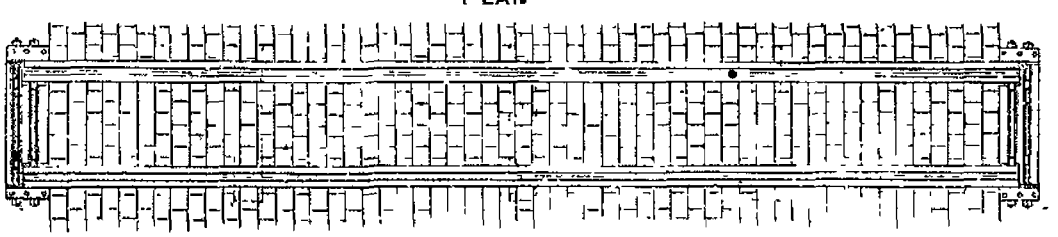
For securing the rails to wood sleepers, we supply a **"dog spike,"** made by special machinery, which are a decided improvement over the old-fashioned spikes. The head is formed with projections on the sides, giving a broad level face for the hammer while being driven, and serving to "draw" the spikes if necessary; for this purpose we also provide **steel spike-drawing bars,** with a claw end suited to the work.

In ordering a semi-portable or **permanent line,** where wood sleepers are to be used, it is well to name the number, so that sufficient spikes may be sent, and we recommend users to order at least 10 per cent of the total number of dog spikes **as extras.**

LEVEL CROSSINGS FOR PERMANENT LINES.

CROSS SECTION

PLAN

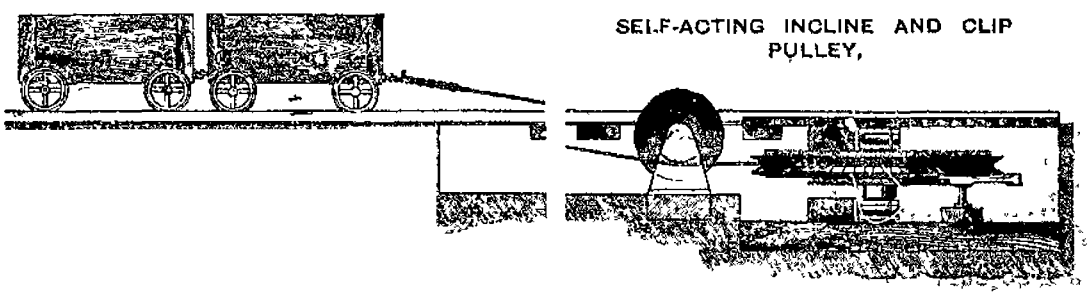


These are formed by double rails, the inner rails forming guard rails, and the space between which may be concreted, paved, or ballasted

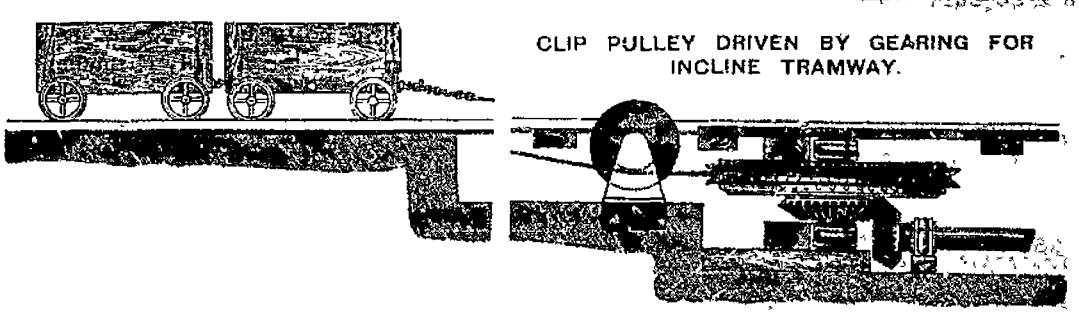
SELF-ACTING INCLINES.

Incline Railways have been largely adopted in chalk and lime quarries, clay beds, and other similar undertakings. They vary in construction and arrangement according to the circumstances of each case; generally, however, they are of the **self-acting type**, the wagons balancing each other, and travelling by virtue of their gravity. These Railways are provided with the necessary crossings and pass-bys for working double traffic, and in connection with them **Fowler's patent clip pulley** gives the utmost satisfaction. The necessary rope carriers, guides, &c., are also supplied, and **steel wire rope** for working the incline.

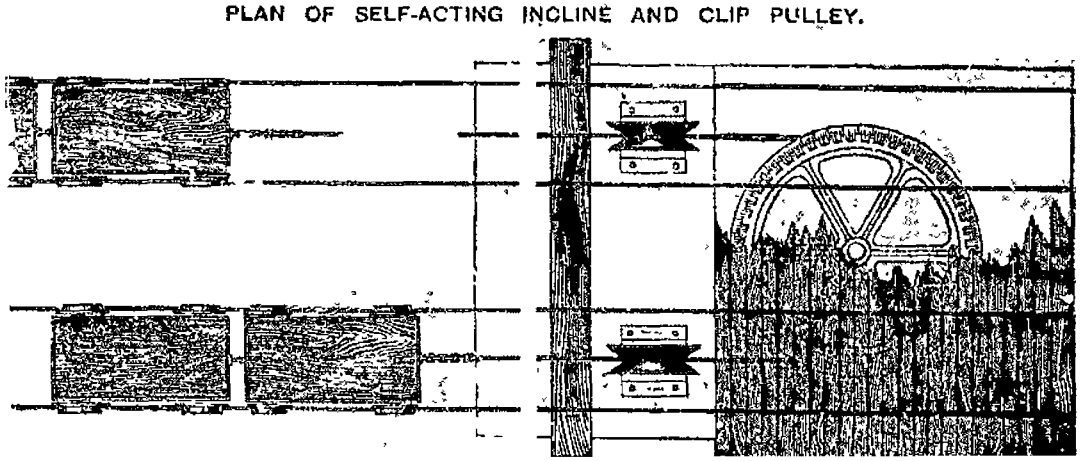
SELF-ACTING INCLINE AND CLIP PULLEY.



CLIP PULLEY DRIVEN BY GEARING FOR INCLINE TRAMWAY.



PLAN OF SELF-ACTING INCLINE AND CLIP PULLEY.



"RAILWAY TOOLS AND SPARES."

To facilitate the laying of the lines, and to prevent loss of time, we supply an **outfit of special tools**, and purchasers are strongly advised to order them.

These tools are supplied in proportion to the length of line required, but a list is here given of what is recommended for a Portable Railway two or three miles long :—

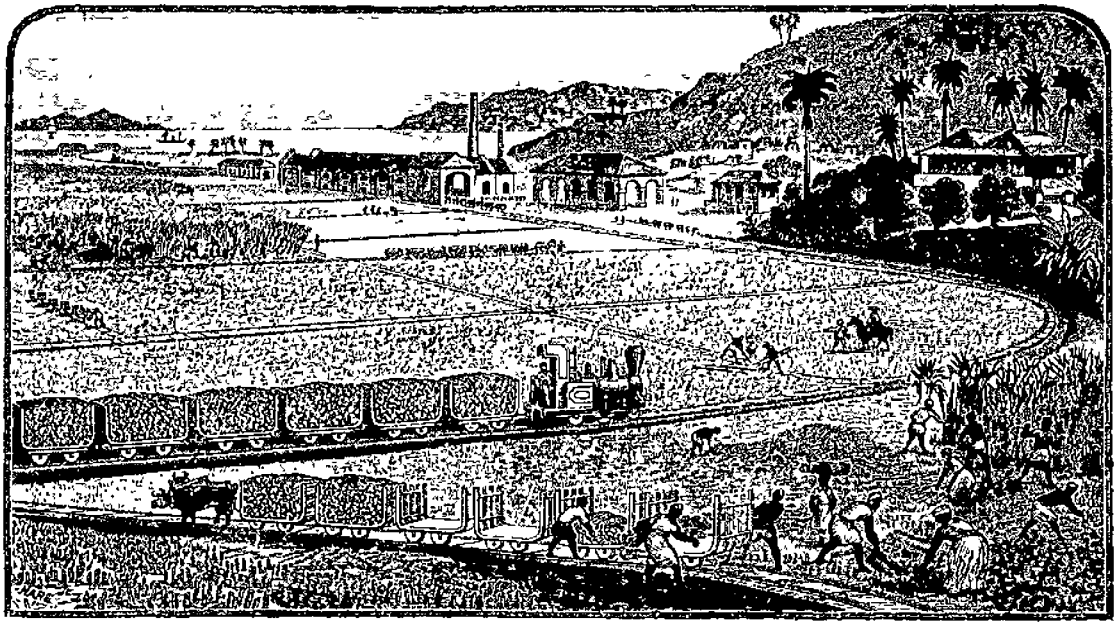
2 Eccentric Tongs, for Greig's Patent Fastening.	6 Screw Keys.	1 Striking Hammer.
1 Rail Bender—"Jim Crow."	2 Steel Crow-bars.	2 Picks and Shafts.
	6 Hand Hammers.	4 Spades.

In addition to these, **a tool box** containing an **assortment of hand tools, &c.**, may also be supplied, it is furnished specially for the work, and will be found extremely useful. Amongst its contents may be mentioned :—

Flat, Half-round, and Round Files;
Flat, Cross-cut, and other Chisels; Hand Hammer, Screw Driver, Oil Can, Movable Spanner, and Steel Drifts; and a variety of Bolts, Rivets, and Washers.

When a line of railway is being laid, **especially a semi-portable or permanent road,** it is expedient to have ready means of **bending the rails** as they may be required to suit the course of the line. For this purpose we supply **rail bending machines, having adjustable rolls,** worked by hand-power, and mounted upon a bogie, with strong frame and platform. This carriage is usually **run upon the line as it is laid.** The rails may be bent a **true curve** of any radius.

We advise **spare clutch bolts** or **pinch plates and bolts** being supplied for the sleepers, so that breakages or losses may be immediately replaced; the quantity recommended is five per cent. of the total number in use.



PLANS OF RAILWAY SIDINGS FOR SUGAR MILLS, SHOWING METHODS OF FEEDING CANE CARRIERS, &c., FURNISHED TO CUSTOMERS, FREE OF CHARGE.

LIGHT RAILWAY PLANT

On the following pages are illustrated the plant used in connection with our **Railways,** as will be seen, the various pieces are self-contained.

The only one requiring any special mention is Fig 6, which is an illustration of what we call a **single inclined plane.** This is used for throwing off a temporary branch at any point of the line. The inclined plane is laid on the rails, and curved lengths are connected to its thicker end, and thus a **branch can be thrown off at any angle** to the main line. A **crossing** can be used for the same purpose, but in practice it is often most convenient to lay the branch line up to the main line and then make the connection, instead of starting from the main line. When this is done the end of the branch line will seldom be brought exactly to the spot necessary to joint it to the curved end of a crossing and as the crossing is placed in the space occupied by a straight length of the main line, it cannot be shifted to suit the end of the branch. A single inclined plane, however, has this drawback, that when laid on the line it stops the "through traffic." To overcome this difficulty it is usual to lay a crossing upon the main line and lead the traffic over it by single inclined planes jointed to each of its ends. The through traffic runs up the first incline over the straight portion of the crossing and down the second incline, passing again on the line. The branch traffic runs up the first incline and round the curve portion of the crossing and so on to the branch line. This is called a **double inclined plane,** and is absolutely necessary for the successful working of a portable line when used for clearing crops and other work requiring temporary branch lines.

Standard radii, 18, 24, 30, 45, 60, and 100 feet.

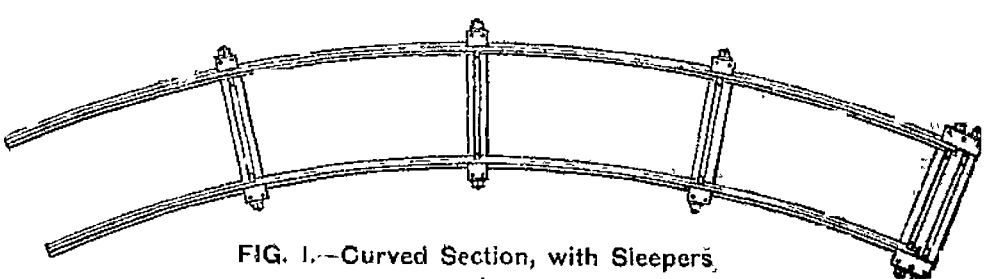


FIG. 1.—Curved Section, with Sleepers complete.

FIG. 4a.

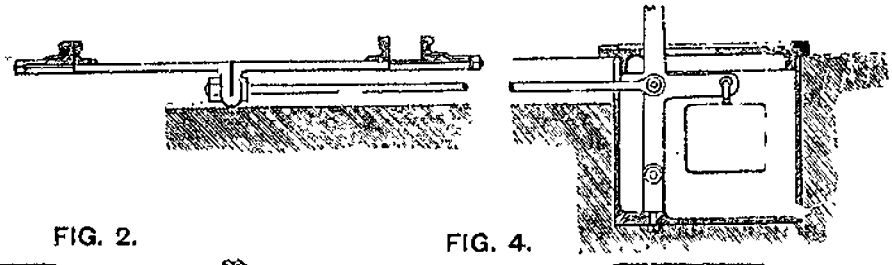


FIG. 2.

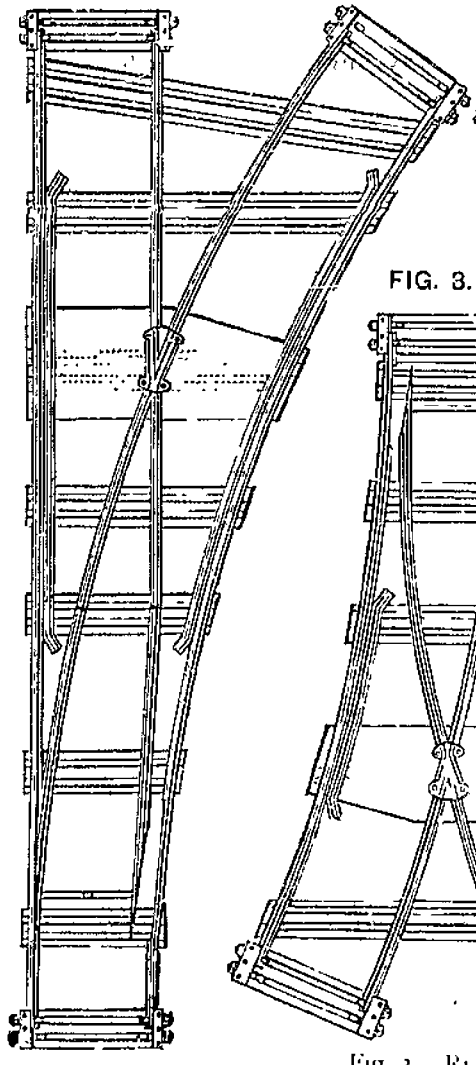


FIG. 4.

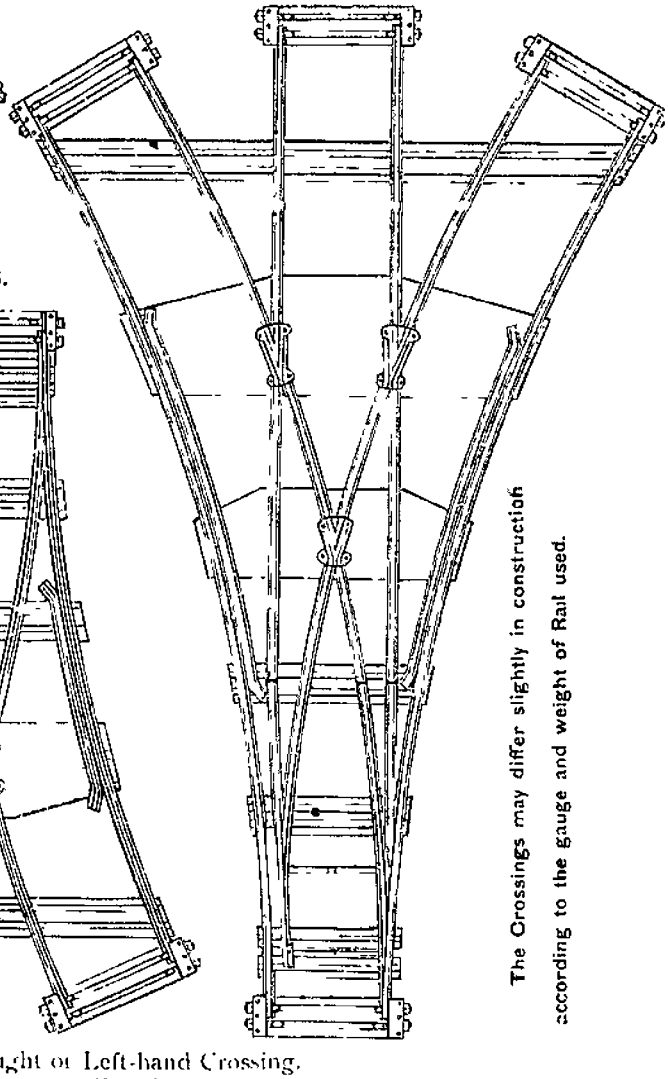
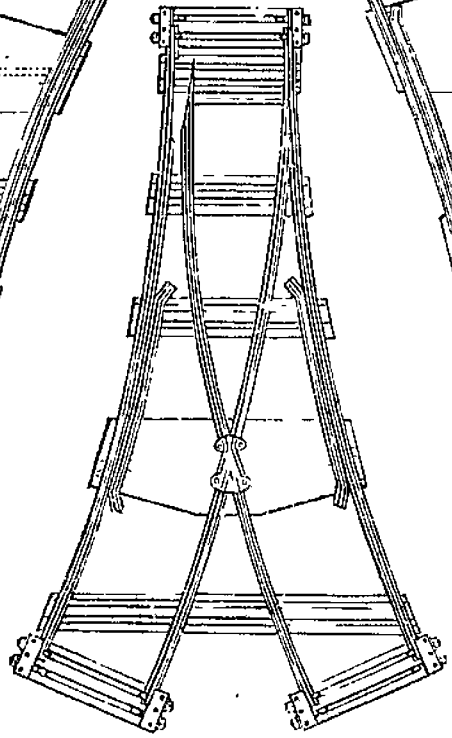


FIG. 3.



The Crossings may differ slightly in construction according to the gauge and weight of Rail used.

Fig. 2.—Right or Left-hand Crossing.
Fig. 3.—Two-way Crossing.
Fig. 4.—Three-way Crossing.
Fig. 4a.—Switch-box and hand lever for Crossings.

CROSS SECTION

PLAN

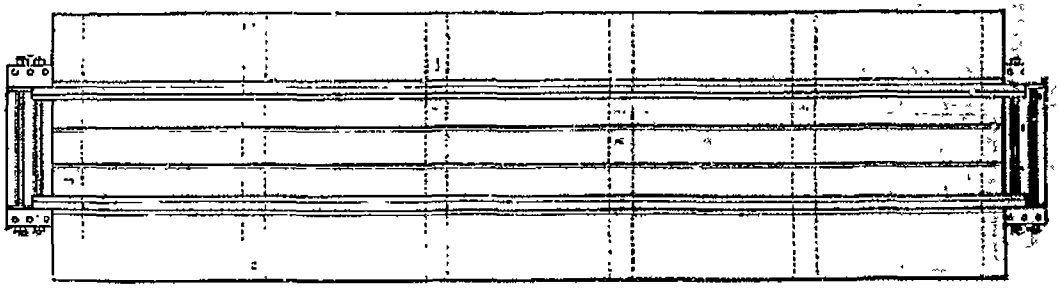


FIG. 13.

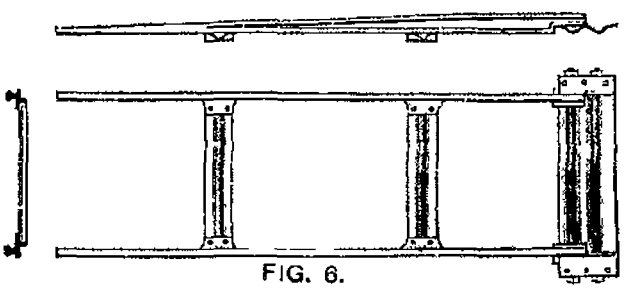


FIG. 6.

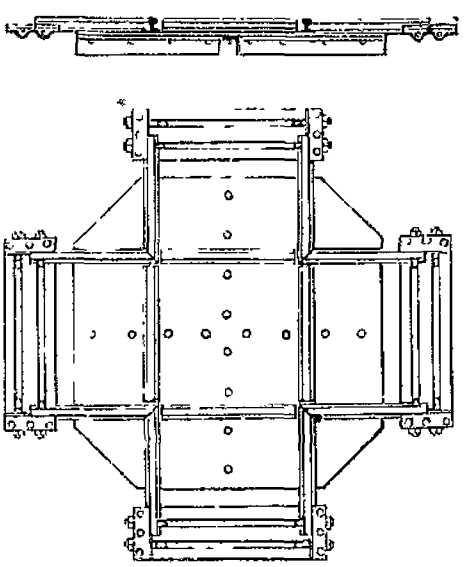


FIG. 5.

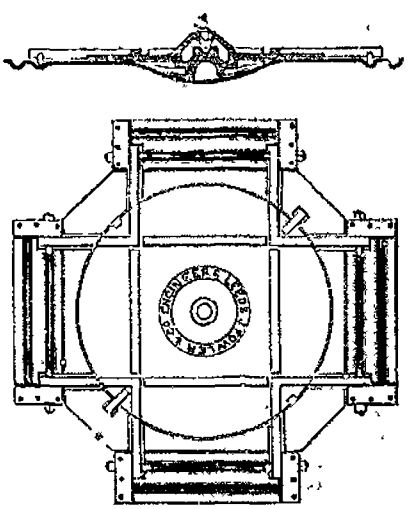


FIG. 7.

Fig 5 —Four-way or Square Crossing.
Fig 6 —Single Inclined Plane, for Temporary Branches.
Fig. 7.—Portable Turntable, type No. 1, 2 ft. 10 in. diameter.
Fig. 13 —Portable Level Crossing (Wood Planking).

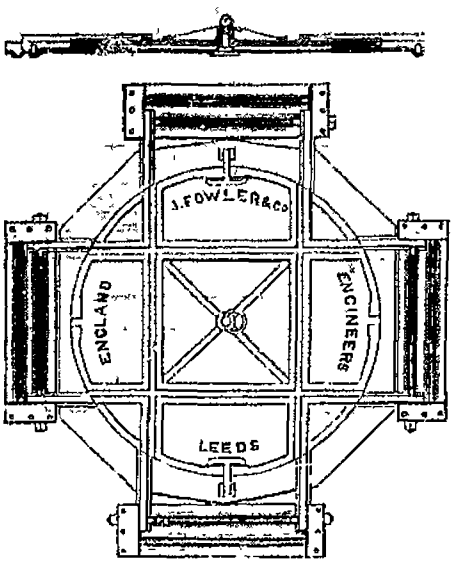


FIG. 8.

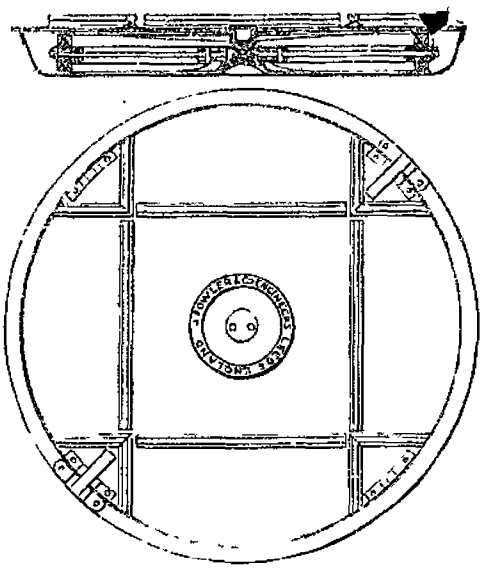


FIG. 9.

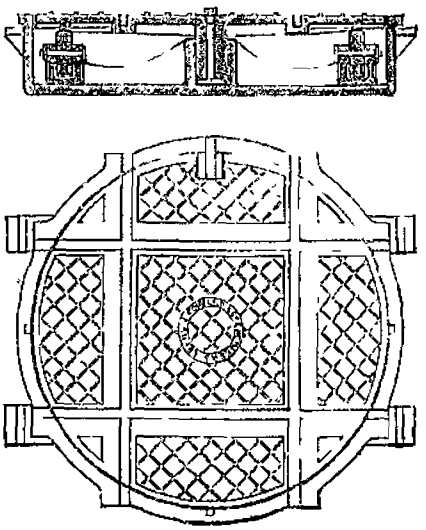


FIG. 10.

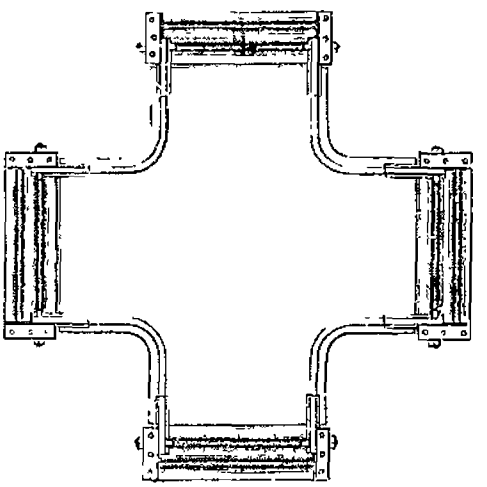


FIG. 11.

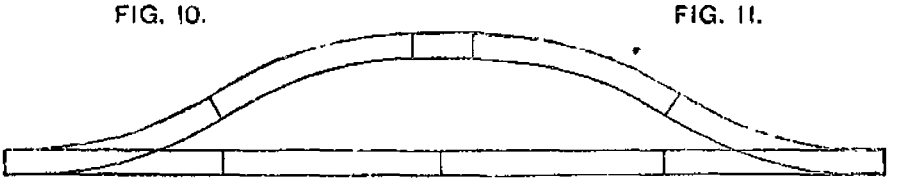


FIG. 12.

Fig. 8.—Portable Turntable, type Nos 2, 3, and 4, from 3 ft to 4 ft 6 in diameter
Fig. 9.—Fixed Turntable, of wrought-iron, type No. 7, 5 ft. diameter
Fig. 10.— „ of cast-iron, type Nos 5 and 6, 4 ft. diameter; and No. 8, 7 ft. diameter
Fig. 11.—Skid Plate, for turning wagons
Fig. 12.—Diagram of Pass-by.

NOTE.—Single-way Locomotive Turntables, with cast-iron shell, &c, type No. 9, 9 ft. diameter; type No. 10, 10 ft. diameter.

The Portable Tipping Platform is an apparatus by which an entire wagon with its load may be tipped to such an angle that the load will slide off easily. This mode of emptying wagons has been adopted largely in **sugar plantations** for unloading cane at the mill, and it can be applied to a variety of purposes where it is important that the produce should be unloaded quickly and evenly.

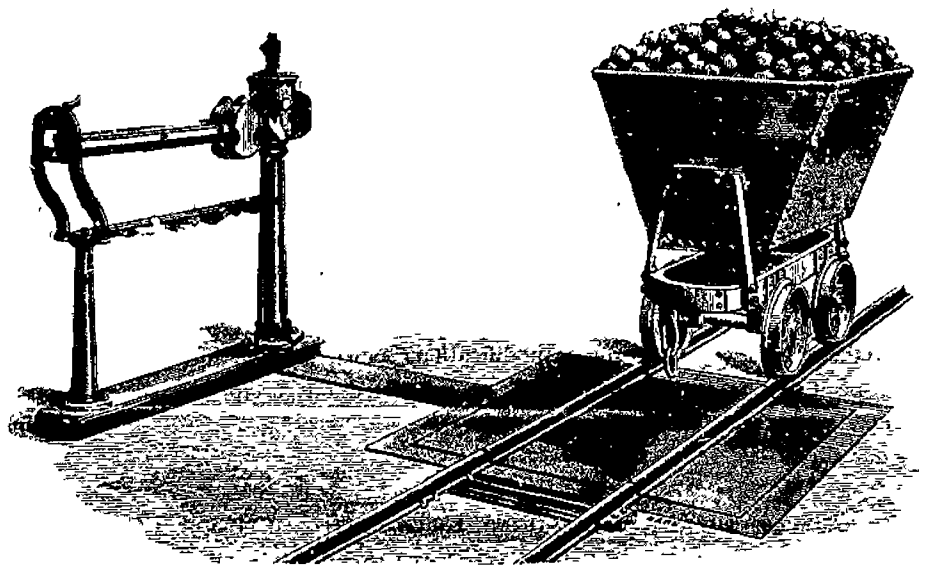
The Fixed Tipping Platform is a similar appliance to the one last described, but is constructed as a fixed apparatus. It is composed of strong timber framing, with the rails brackets, lock hooks, &c., secured thereto. This apparatus is strongly recommended where unloading is to take place constantly at any certain parts of a line, and for tipping loads from narrow-gauge to broad-gauge trucks.

The Wharf Tipping Apparatus has been designed to empty a wagon of its load by tipping it, either end way or side way, to any angle, or to a vertical position, or by turning it completely over. It is already in use at **collieries, wharfs, chalk pits and other similar works** where material is tipped almost vertically into shoots, boats, hoppers, &c.

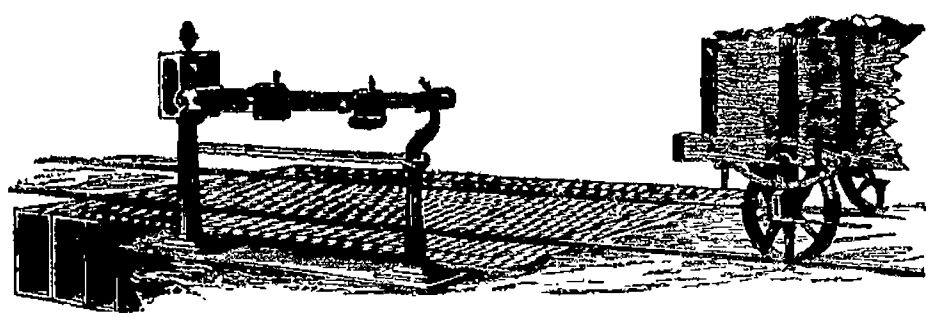
It is needless to describe the many modifications which may be introduced for the above purposes; specifications and estimates will be submitted on receipt of particulars of actual requirements.

PLANS OF RAILWAY SIDINGS, FOR SUGAR MILLS, WITH METHODS OF FEEDING CANE CARRIERS, &c., FURNISHED TO CUSTOMERS, FREE OF CHARGE.

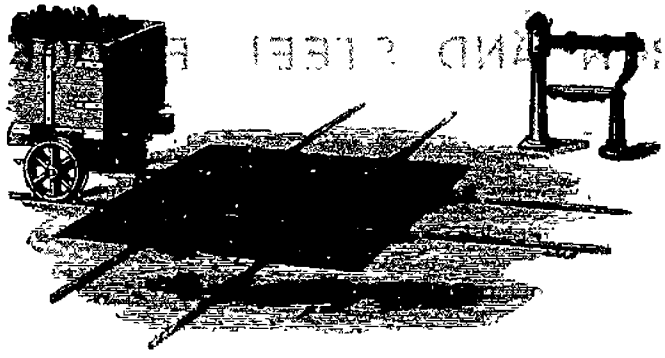
WEIGHING MACHINES.



No. 1 is a "Special" Railway Platform Dormant Machine, with table 3½ ft square, weighing capacity up to 2 tons; it is very substantial, of unerring accuracy, and expeditious in action. This Machine is fitted with patent **double steelyard Taring indicator,** *graduated in divisions of 1 lb.*, which dispenses with **loose weights.**

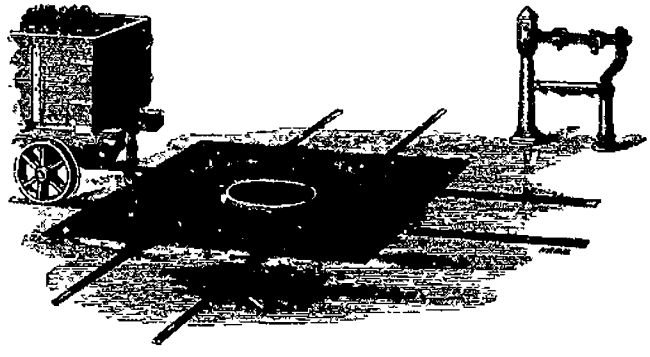


No. 2.—This Machine is suitable for weighing bogie wagons, or two or three small wagons may be weighed at one time. The platform is 14 ft. long; weighing capacity to 4 tons; fitted generally as No. 1.



PIT-BANK WEIGHING MACHINES for Mines, Collieries, &c. Fitted generally as No. 1. The steelyard is carried away from table so as to be covered by a shed or office.

Weighing capacity to 1½ tons, with table 4 ft. 0 in. × 4 ft. 0 in.
6 ft. 6 in. × 4 ft. 6 in.
7 ft. 2 in. × 4 ft. 6 in.



COMBINED PIT-BANK WEIGHING MACHINE AND TURNTABLE.—The platform has a revolving table, with projecting ring, corresponding to the gauge of the line, so that wagons may be weighed and then turned at once on to any of the branch lines.

Fitted with double steelyard, &c., same as No. 1, weighing capacity to 1½ tons, with turntable 4 ft diameter.
Do. do. weighing capacity to 2 tons, with turntable 6 ft. diameter
Do. do. 2½ tons 6 ft.

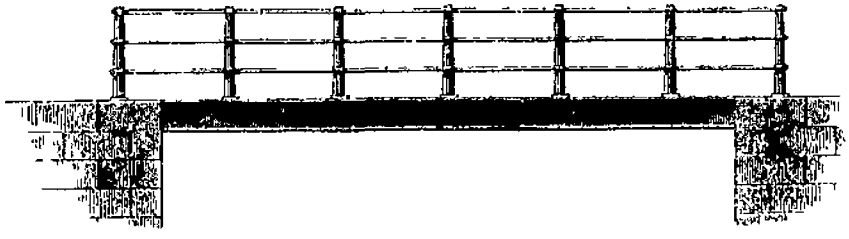
NOTE.—The above Weighing Machines may be graduated and adjusted to any foreign standard if ordered specially.

IRON AND STEEL BRIDGES.

In connection with our **Light Railway Plant** we have found a demand for structural ironwork, &c., for bridges and buildings of a class suitable for pioneer lines and local railways.

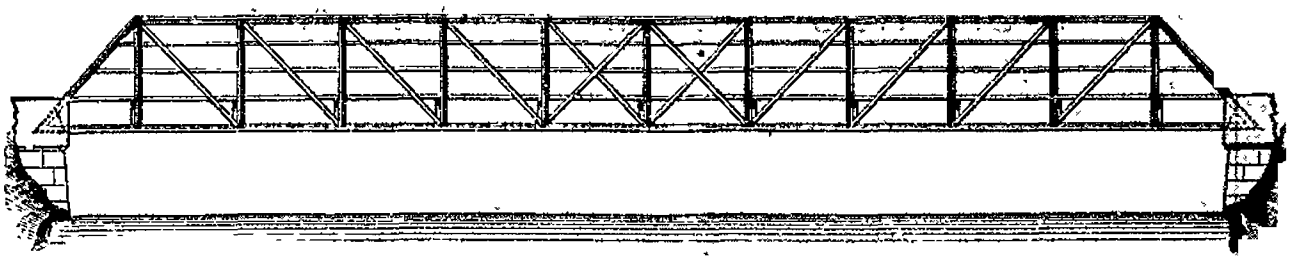
To meet the demand, arrangements have been made for the prompt execution of orders, and the following wood-cuts will convey an idea of what has been done in this direction As, however, the requirements vary more or less in every case, we do not bind ourselves to these designs; nor can we publish prices, but shall be pleased always to submit estimates and specifications for this class of work upon receiving the necessary particulars.

The few designs of Bridges here given are merely intended to indicate some of the **more simple forms** usually adopted. Each inquiry has to be **treated independently** according to the length of span, width of roadway, and load requiring to be provided for, and when these particulars are received, we shall always be pleased to submit the design and strength which **we consider best adapted** for the requirements. Specifications and estimates will likewise be given

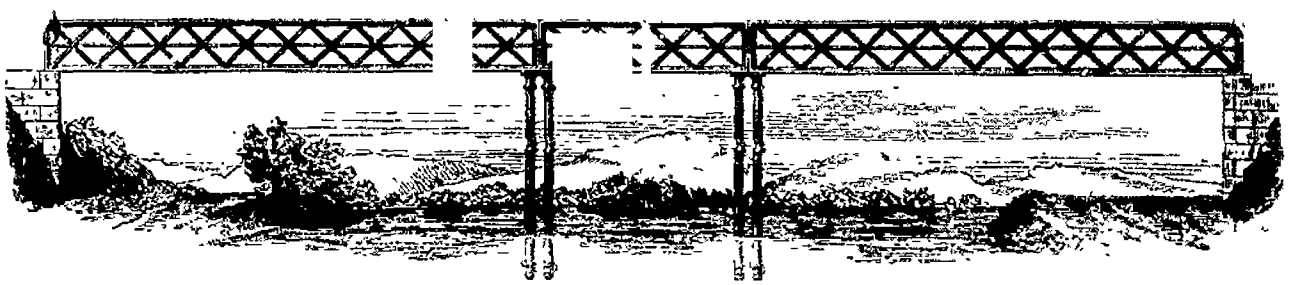


This design illustrates a solid **Girder Carriage Bridge,** well suited for spans– up to about 25 feet—and moderate in price. The strength and number of longitudinal girders depend upon the load to be carried over, and whether a timber or concrete roadway is to be formed It may here be stated that a **timber roadway** is **much cheaper** than concrete. The hand-rail may be either of wood or iron of a plain character, such as that illustrated, or an ornamental design can be used.

Inquiries for Bridges should in all cases state *length of span* face to face of abutments, *width of roadway*, if for *timber* or *concrete* roadway, and the *load* to be carried, and as full particulars of the traffic and vehicles as can possibly be given.



The above or other similar **Lattice Girder Bridge** is well suited for **Carriage Bridges** from 25 ft. to 120 ft. single span, and may have either timber or concrete roadway. In the longer spans **steel is largely employed** to attain a maximum of strength with a minimum weight of materials.



This is an important form of **Lattice Girder Bridge,** suitable for lengths which cannot be attained by a single span. As a rule, single spans up to 100 ft. will be found the most economical; but where that length is exceeded, one or more intermediate Iron Piers are **most advantageous** in price.

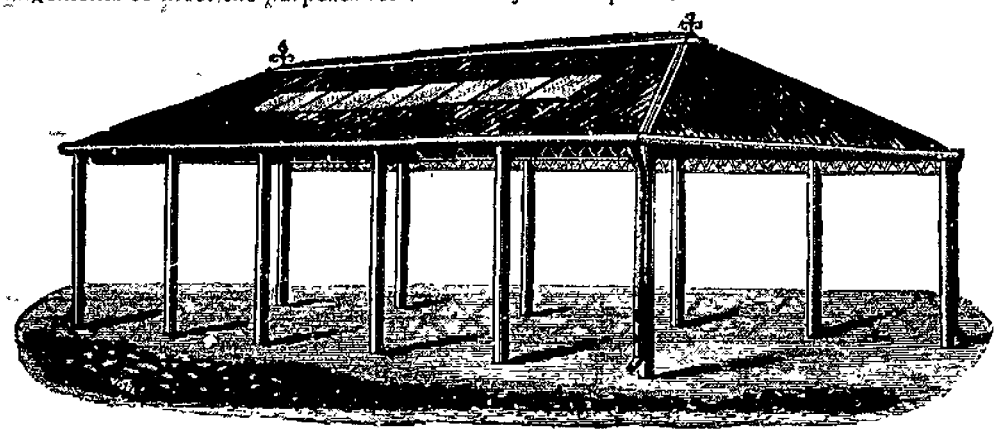
Iron Piers are formed of two or four piles screwed into the subsoil, and securely braced together. It is necessary, however, to **carefully test the subsoil** of the river bed before screw-piles are decided upon—*first*, to ascertain how far the piles require to be screwed down to reach a sufficiently solid foundation; and *second*, to make sure that the subsoil is free from boulders and rock—if the latter exist, the screwing of the piles may be rendered impossible.

Inquiries for this type of Bridge should state the *height* from the bed of the river to the level of roadway, the nature of the subsoil, and particulars of water level, &c., in addition to the requirements of the Bridge itself.

It may be noted that the leading principle of our Light Railways, as pointed out on page 8, applies to all the plant used in connection. The loads being divided into small lots, and distributed upon a large number of wheels, permits the use of **light,** and consequently **economical,** bridges. In short, the chief feature of our system is **lightness**—*Light tracks, light loads, light engines, light wagons, and light bridges.*

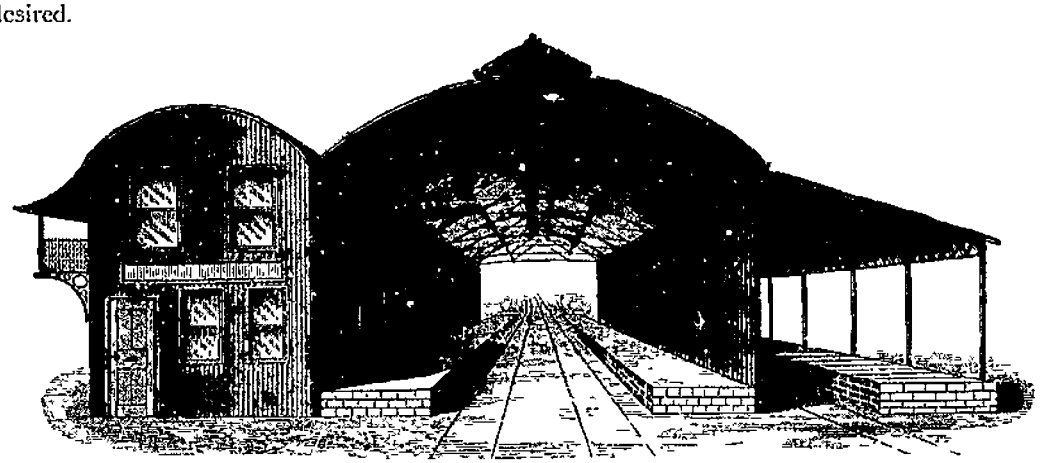
IRON ROOFING AND BUILDINGS.

IRON Roofing and Buildings are **largely adopted** at home and abroad for an infinite variety of purposes, and they will be found **thoroughly adapted** in strength, construction, and arrangements to meet the purposes for which they are required.



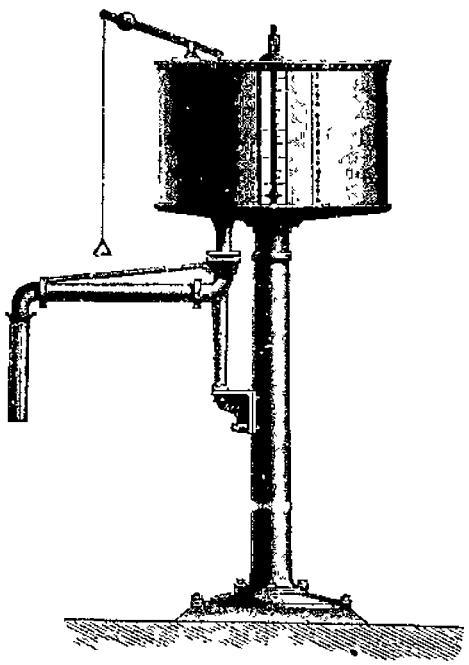
This design illustrates a **"Pavilion" ended roof,** carried on iron columns to form an open shed. If an enclosed building is desired, the sides and ends can be fitted with galvanized sheet iron, with hinged or sliding iron doors as required, and iron window frames, and thus a most complete enclosed building may be formed. Up to about 40 ft. span a **curved trussed** roof is the **least expensive,** but beyond that width ridge-shaped roofs (shown above) have the advantage in price, provided they are made with ordinary "Gable" ends. "Pavilion" ends add considerably to their cost.

In writing for prices it is necessary to state *length*, *width*, and *height* to eaves of the building; if to be *open* or *enclosed*; and if enclosed, the number and size of *doors* and *windows* desired.



This illustration shows the application of galvanized iron to **Railway Stations,** of which there are an infinite variety of arrangements, ranging from the simple roadside station suitable for country districts, to the more handsome and commodious edifices required for city or terminal stations. All such can be **economically** worked out in iron; and upon receiving the necessary information as to accommodation required, &c., we are prepared to submit **designs** with **specifications** and **estimates.**

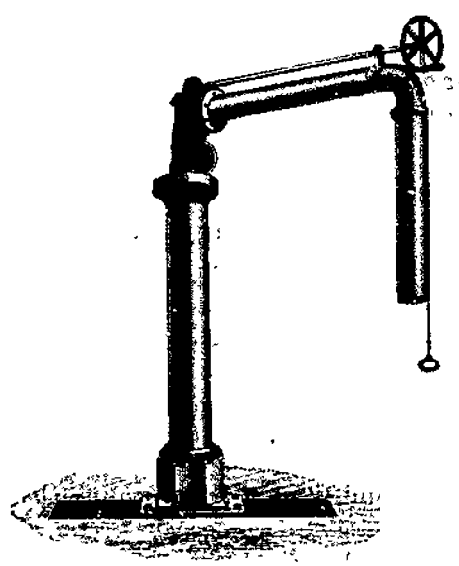
WATER CRANES--COLUMNS AND TANKS.



Water Crane with overhead Tank, supported on cast-iron central pillar—the swinging arm is fitted to the bottom of Tank.

Provided with float and indicator board; flexible hose and fittings complete.

Simple Water Cranes for use at Stations, &c., where the main pressure is sufficient; fitted with ornamental cast-iron column and base plate, swing arm and valve, which may be worked from the Locomotive; complete with flexible hose and fittings.



SERVICE TANKS FOR LOCOMOTIVES, of wrought or cast-iron, with pillars, &c.; for same, are supplied to meet customers' requirements.

Specifications and Estimates on application

SIGNALS, &c., FOR LIGHT RAILWAYS.

Wrought-iron Lattice **Home and Distant Signals** of any description, either for working by hand or in connection with "Locking Apparatus." Single or double semaphore arms may be used, or simple revolving or eccentric discs with suitable lamps, spectacles, &c

For small **Local Railways** the distant signals are usually worked *from the station platform* by means of compensating pull-over levers, with stakes, pulleys, and connecting wires.

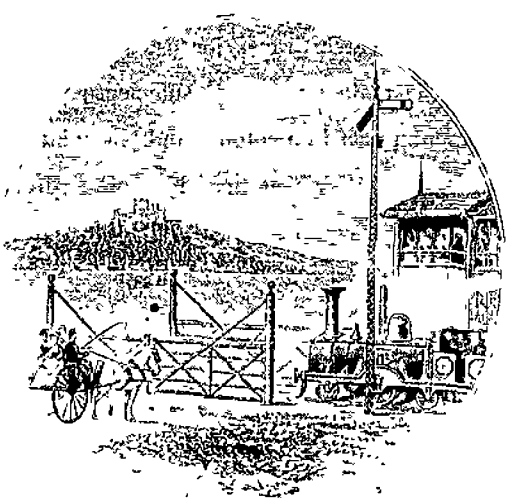
NOTE.—These Wrought-iron Lattice Columns will also be found useful in open situations for suspending the lamps and containing the apparatus for electric lighting; also for signalling masts for fixing on pier-heads, and other similar purposes.

Where the posts are of native timber, we can supply **complete sets of ironwork,** consisting of sockets, wrought-iron ladders, arms, lamps, hand-levers, and connections to complete either single or double signals.

Levers, rods, connecting wires, &c, for witches and signals, suitable for attaching to **any signalling apparatus** (either hand or interlocking), to meet the requirements of customers.

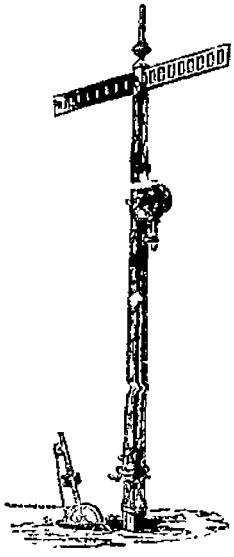
IMPROVED SELF-ACTING GATES for level crossings, with catch stop boxes to hold the gates in position, and arranged to work down level with roadway when the gates are opened These gates may be connected for working from the signal box, and interlocking with signals if required.

Hand Wicket Gates may also be supplied if necessary. These may be *worked from signal cabin*, and be fitted with interlocking gear



Designs and Estimates, with full information, will be furnished to our clients upon receipt of the necessary particulars

SIGNALS, &c., FOR LIGHT RAILWAYS.



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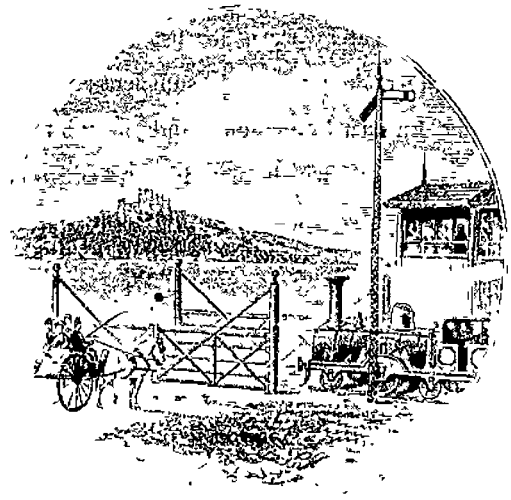


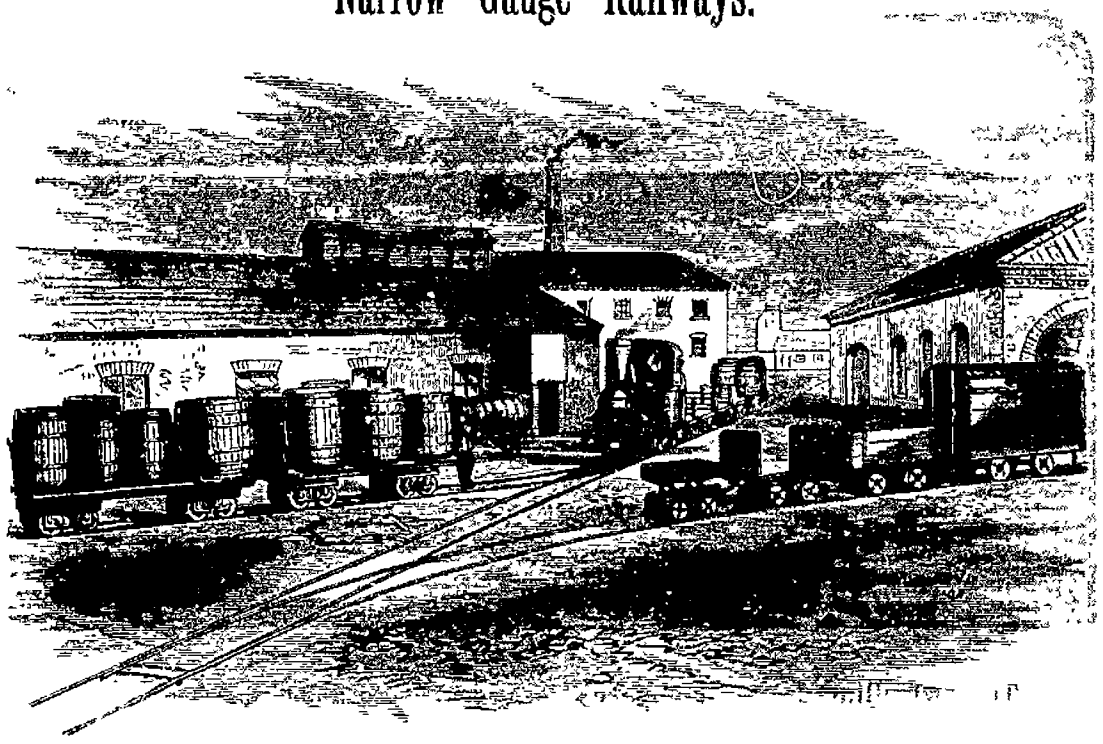
Designs and Estimates, with full information, will be furnished to our clients upon receipt of the necessary particulars

GENERAL DESCRIPTION

ROLLING STOCK

FOR USE WITH

Fowler's Portable, Semi-Portable, and Permanent Narrow Gauge Railways.



In the following pages we describe our leading types of Rolling Stock for Light Railways.

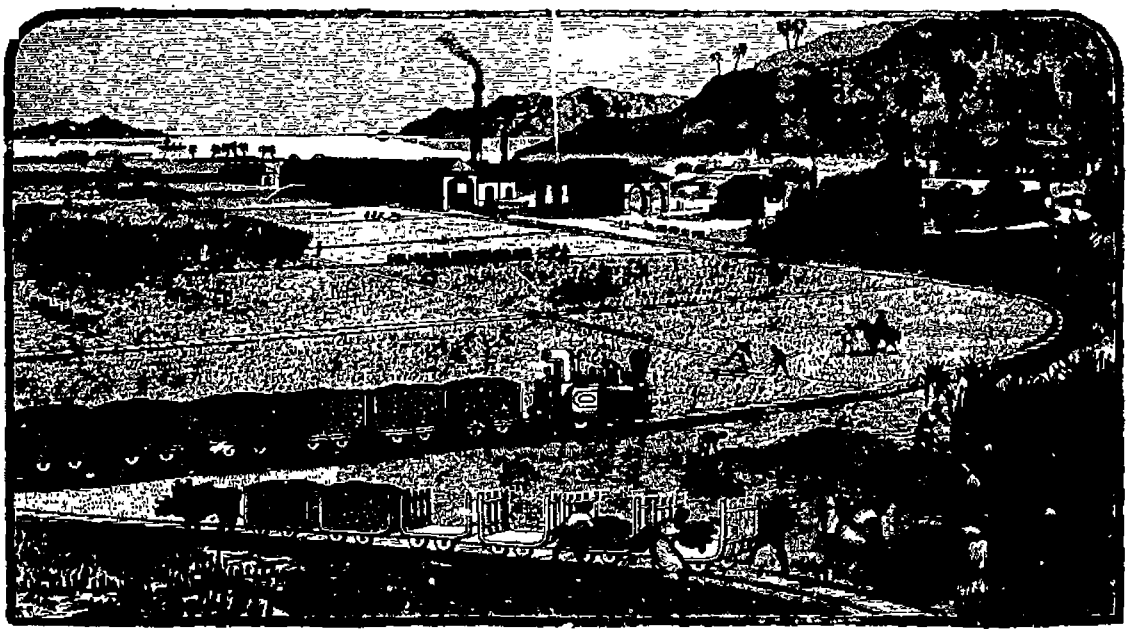
In giving orders for Wagons and Rolling Stock generally, customers are urged to **adhere to our standard designs and sizes,** as by so doing they may ensure **prompt execution of orders,** however large and may look forward to receiving the **best and most useful plant,** as our various designs are the outgrowth of an extensive practical experience in this class of manufactures.

For Export the Wagons constructed entirely of iron and steel have special advantages. They may be **packed close** for shipment, and can be readily divided into light packages for easy transport up country

Bogie Wagons are strongly recommended where large masses of material have to be removed. The short wheel-base of the bogies admits of their running freely on curves of small radii, and lengthy articles may thus be conveniently carried.

The under-carriages of the 4-wheeled wagons, and the bogies in the bogie wagons are similar in construction. The following explanation of the under-carriage will apply generally to all wagons, except where otherwise specified.

The main frame is built of channel iron or steel, bent at the ends, with the flanges inwards, forming strong central buffers, or seatings for spring buffers. The frames are riveted by hydraulic machinery and tied and stayed by plates, through which passes a central draw-pin, to which are attached two swivelling draw-bars, with draw-links and coupling hooks.



The swivelling draw-bar is essential for wagons intended to be drawn by animals, and to be used on lines with curves of small radii. By its use the animals drawing the train can walk at the side of the Railway without danger of causing the wagons to leave the track, and in passing round sharp curves it diminishes the friction and wear and tear. Springs may be fitted on the draw-bars for relieving the wagon from shocks and jerks.

When locomotives are used, spring buffers and spring draw-gears are recommended, to relieve the wagon of shocks in drawing or shunting.

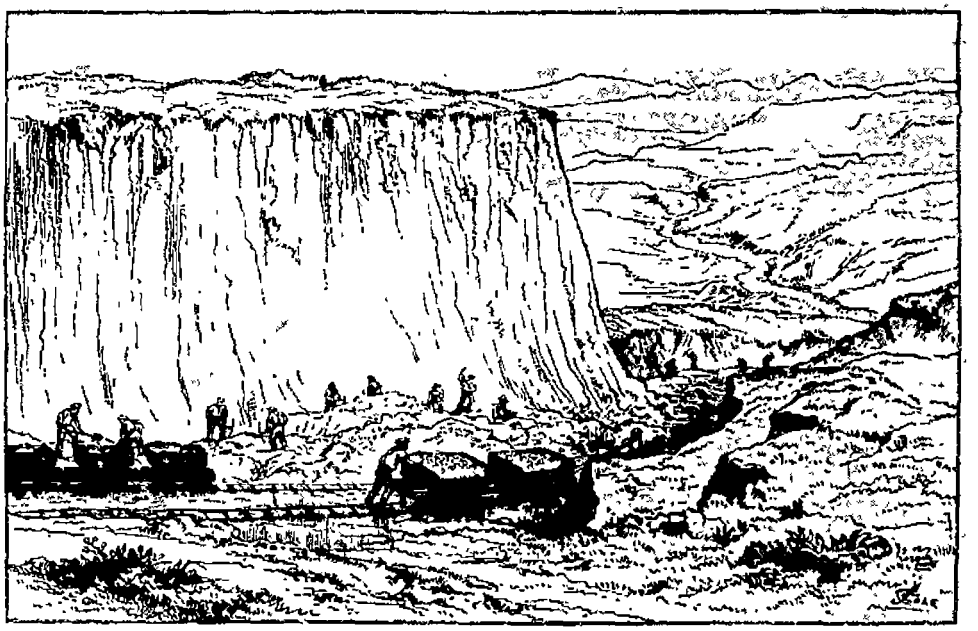
The wagons and bogies are all carried upon **steel axles,** the journals working in **improved grease axle boxes.** The space for lubricant is ample, and by means of a hinged lid on the top, dust and dirt are excluded. Either oil or grease may be used; in either case the oil cup underneath, containing a small sponge, retains and absorbs any waste oil which passes round,

also serving to keep the journal constantly clean, and providing continual lubrication. The top bearing is of **hard gun-metal,** and of such form that it can be **easily renewed** when worn out. **All parts** of the axle boxes are made **interchangeable, and a stock of duplicates** are recommended, full list of which will be found on page 53.

The **steel springs** are a source of economy, as they **prevent wear and tear.** They ensure smooth and easy running, and are a safeguard against "running off" the roughly laid lines.

The wagons are **mounted on wheels** of diameters varying according to the gauge pressed and keyed on the axles.

A simple **side lever brake** may be fitted to the wagons and bogies, or a powerful brake-gear, worked from the platform, may be supplied for the larger wagons. It is advisable to have **one brake wagon in every train;** a good proportion is **one brake** to every **five or six wagons,** and where inclines are steep, the number of brakes should be increased.

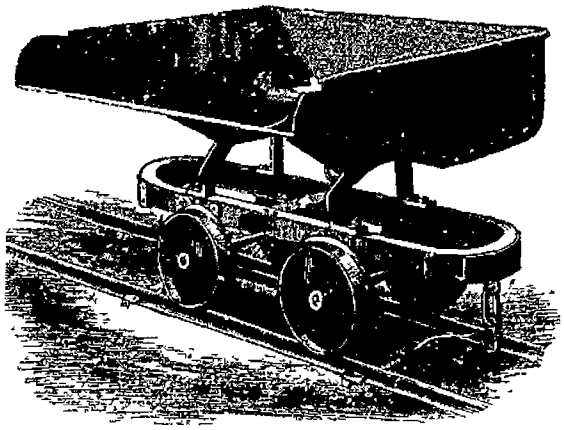


Wagons having wood platforms or bodies, and which are to be exported for use in hot climates, are supplied fitted up complete with the **exception of the woodwork;** it is often advisable that this should be supplied in the country to which they go, as English wood does not stand high temperatures; in all cases, however, we prefer to send **one wagon,** with **woodwork and fittings complete,** to serve as a pattern.

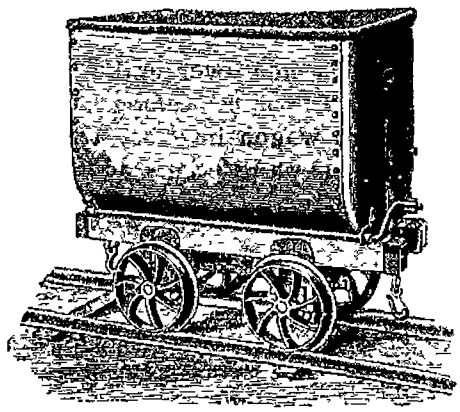
N.B.—One type of under-carriage may be made to serve several purposes, by using different bodies. Special quotations will be given for these as required.

SINGLE SIDE and END TIPPING WAGONS, Types A and B and D, for use in Brick, Lime, Sewage, and Chemical Works; Road and Railway-making, and excavation works generally. The boxes are of such shape that clay, soil, &c., will free itself during tipping, the load being shot well forward clear of the wheels. **Standard boxes** are made with capacity of 14, 20, 30, and 75 cubic feet. For **locomotive power** they are fitted with grease axle boxes, horn bars, and springs; with extra strong frames and buffers, and cast-steel wheels. For **manual and animal power** the wagons have fixed axle brackets, with grease-box and brass bush, and improved compound chilled wheels.

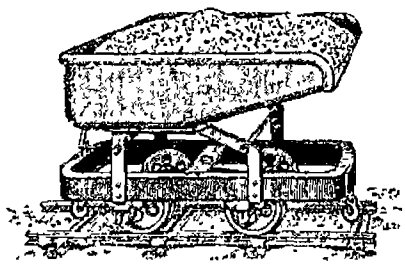
Type A.

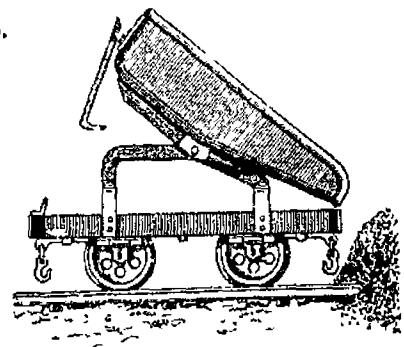


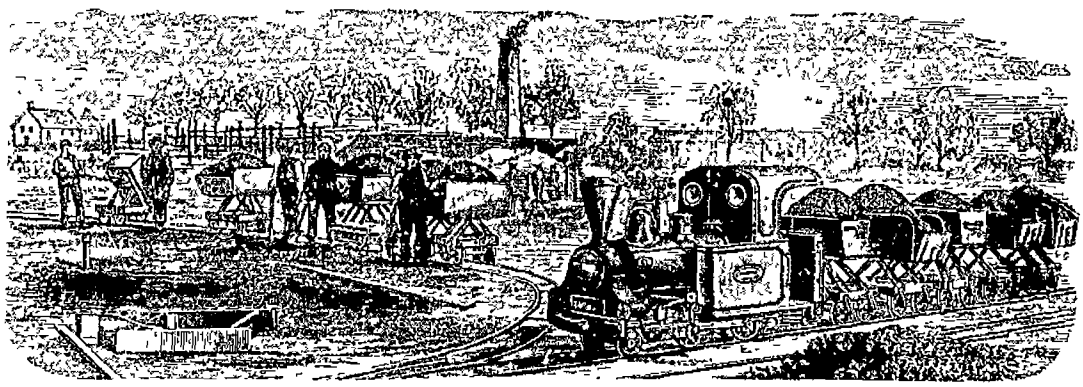
Type D.



Type B.







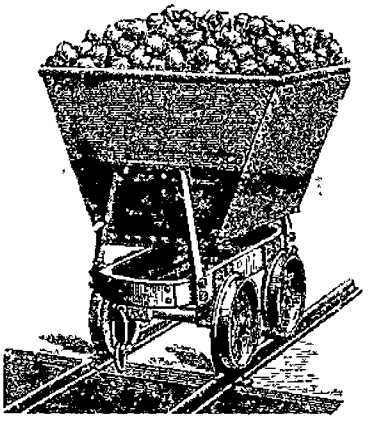
WAGONS OF ANY CAPACITY UP TO 100 FEET MAY BE SUPPLIED.

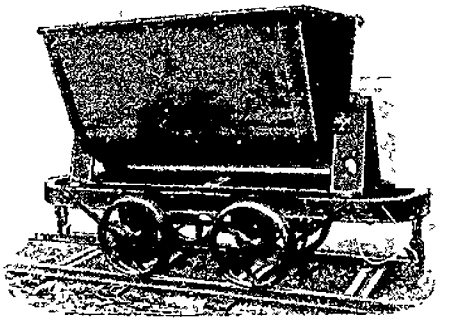
DOUBLE TIPPING WAGONS, Type C, specially suitable for carrying semi-liquic materials and finely ground substances, also for dredging operations and conservancy work.

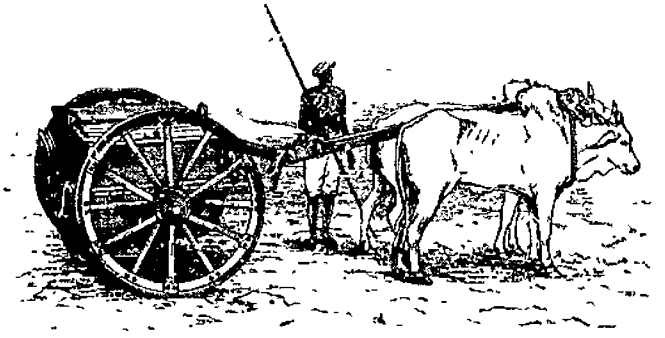
The **under-carriage** is easily converted into a **platform** or **ballast truck,** and may be used for every kind of small goods traffic.

For **manual and animal power** the wagons have fixed axle brackets, with grease-box and brass bush, and improved compound chilled wheels.

For **locomotive power** the wagons are fitted with grease axle boxes, horn blocks and springs, and cast steel wheels, the frames and buffers being of extra strength.



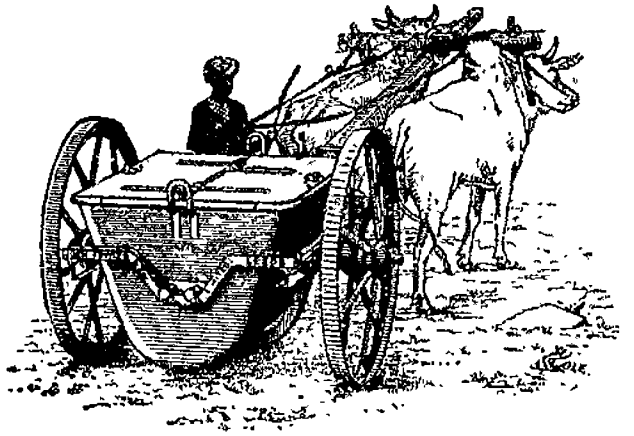




Standard boxes are made with a capacity of 9, 14, 20, 30, and 56 cubic feet.

The woodcuts show the boxes mounted on a wrought-iron bullock cart, for conservancy work, &c.

The transferring the box from the wagon frame on to the bullock cart is done by a small hoisting apparatus, which enables the changing to be done very quickly. The railway wagons, and carts, as shown, enable sanitary authorities to deal successfully with the question of removal of sewage and city sweepings.

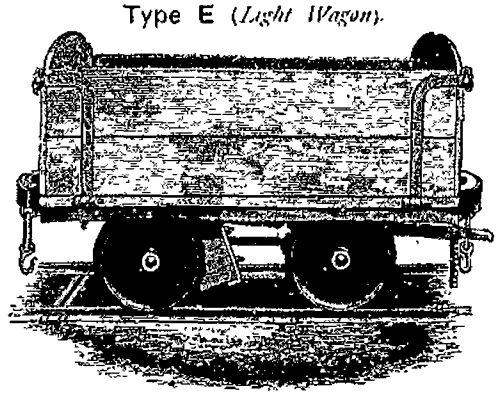


This Wagon may be made with the box to tip on four sides.

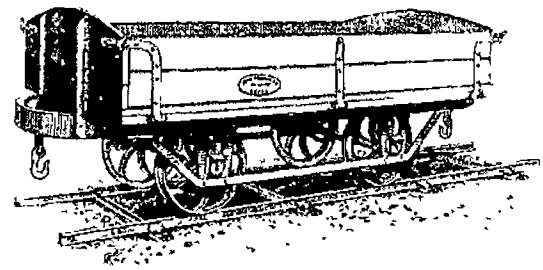
OPEN GOODS OR BALLAST WAGON, Type E, convenient for carrying almost **any description of material.**

For **manual or animal power,** the wagons have fixed axle brackets, with grease box and brass bush, and improved compound chilled wheels, 10 in. or 12 in. diameter.

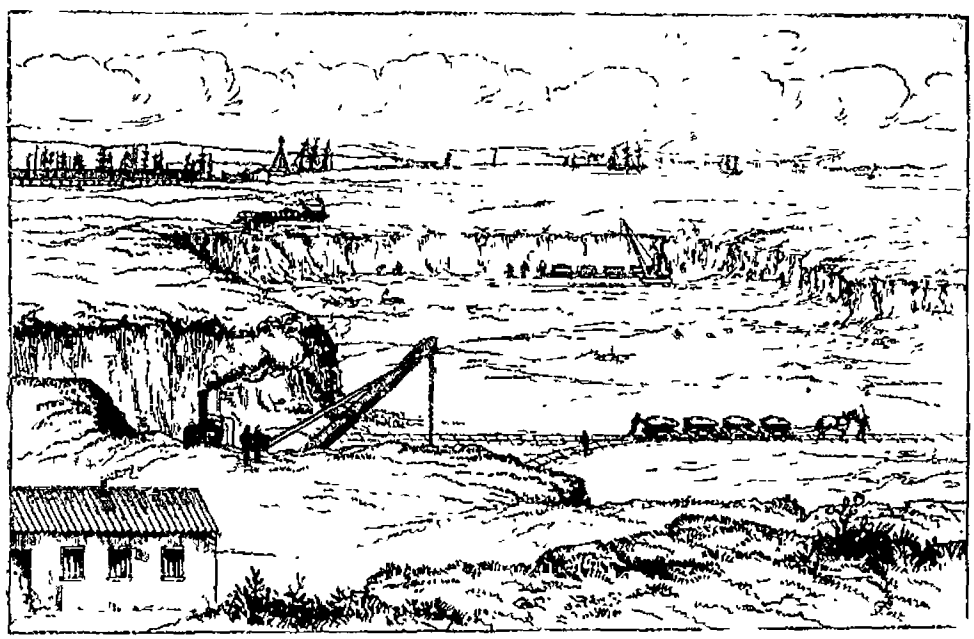
Type E (*Light Wagon*).



Type EE (*Heavy Wagon*)

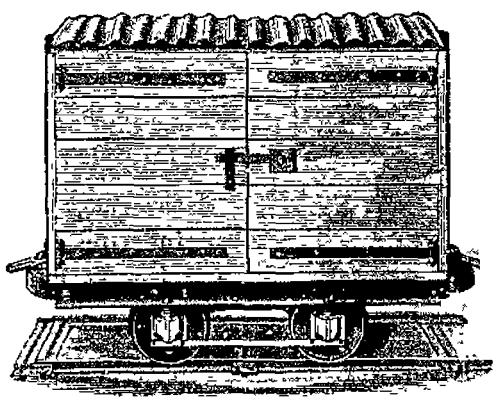


For use with **locomotive power,** and for Permanent Lines, we construct a special wagon—**Type EE,** as shown above, fitted with central buffers, horn blocks, springs, and steel wheels, equal to a load of three tons.



COVERED GOODS WAGON, Type F, for carrying any kind of goods or material likely to be injured by wet or exposure to the weather. The body is made of well-seasoned pitch-pine boards; both sides form doors, hinged to the ends; and the whole is covered by a galvanized corrugated iron roof

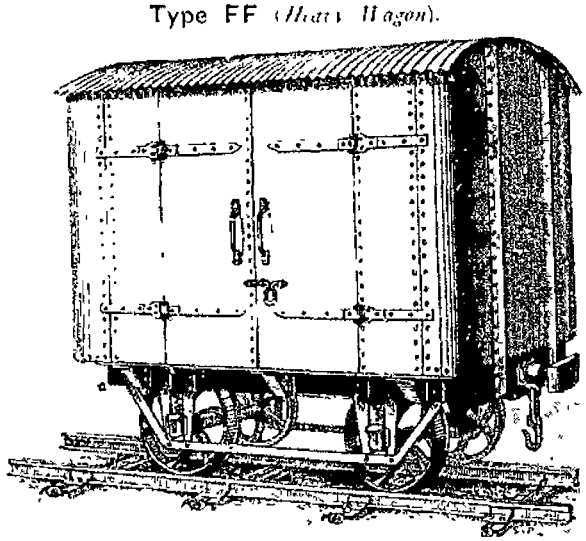
Type F (*Light Wagon*).



For **manual and animal power** the wagons have fixed axle brackets, with grease box and brass bush, and improved compound chilled wheels 10 in. or 12 in. diameter.

Can be built completely of iron

Type FF (*Heavy Wagon*).



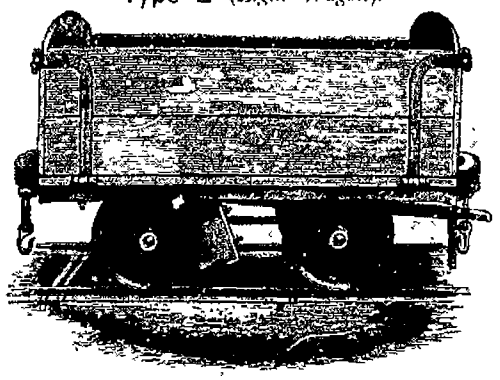
Type FF (Heavy Wagon), for use with Locomotives, with **steel body**; specially designed for hot countries (no wood is used in the construction of this wagon).

The body can be built of wood, if preferred.

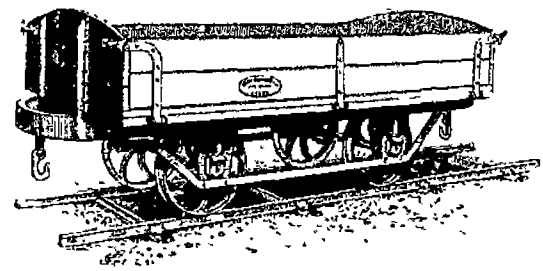
OPEN GOODS OR BALLAST WAGON, Type E, convenient for carrying almost **any description of material.**

For **manual or animal power,** the wagons have fixed axle brackets, with grease box and brass bush, and improved compound chilled wheels, 10 in. or 12 in. diameter.

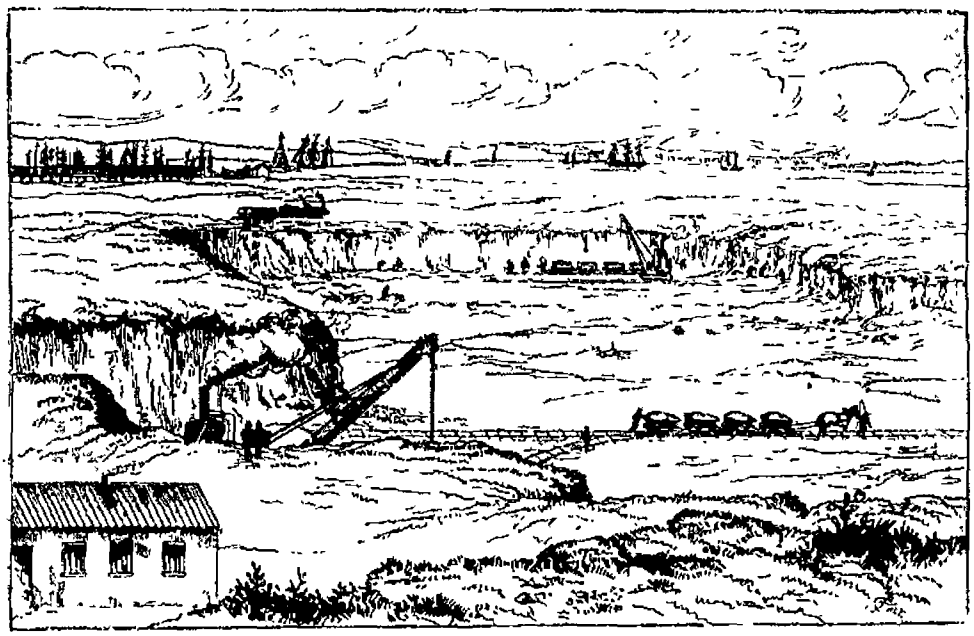
Type E (*Light Wagon*).



Type EE (*Heavy Wagon*)

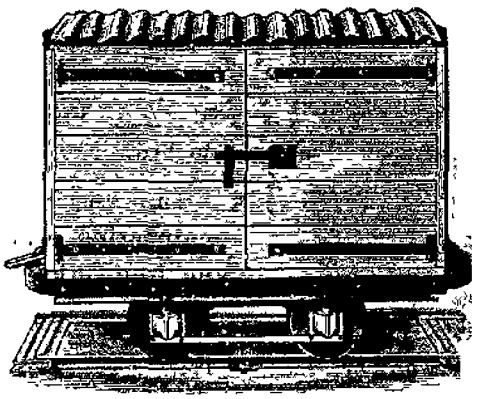


For use with **locomotive power,** and for Permanent Lines, we construct a special wagon—**Type EE,** as shown above, fitted with central buffers, horn blocks, springs, and steel wheels, equal to a load of three tons.



COVERED GOODS WAGON, Type F, for carrying any kind of goods or material likely to be injured by wet or exposure to the weather. The body is made of well-seasoned pitch-pine boards; both sides form doors, hinged to the ends; and the whole is covered by a galvanized corrugated iron roof.

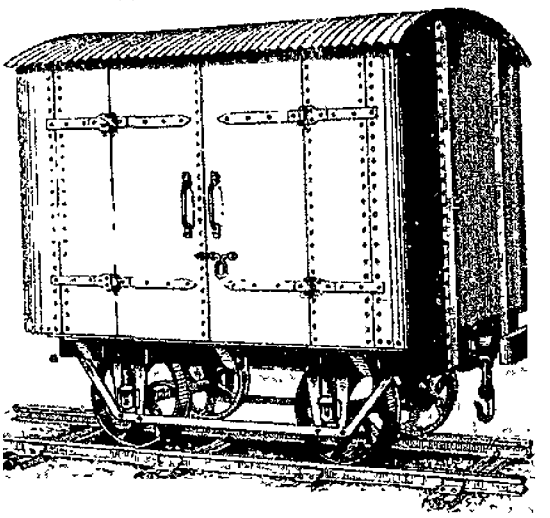
Type F (*Light Wagon*).



For **manual and animal power** the wagons have fixed axle brackets, with grease box and brass bush, and improved compound chilled wheels, 10 in. or 12 in. diameter.

Can be built completely of iron

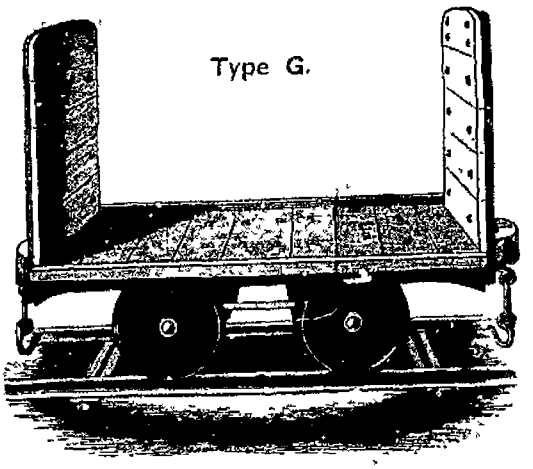
Type FF (*Heavy Wagon*).



Type FF (Heavy Wagon), for use with Locomotives, with **steel body**, specially designed for hot countries (no wood is used in the construction of this wagon).

The body can be built of wood, if preferred.

PLATFORM WAGON, Type G, for transporting any description of goods, slates, stone, bricks, corn in sacks, &c., and for discharging cargoes from ships.



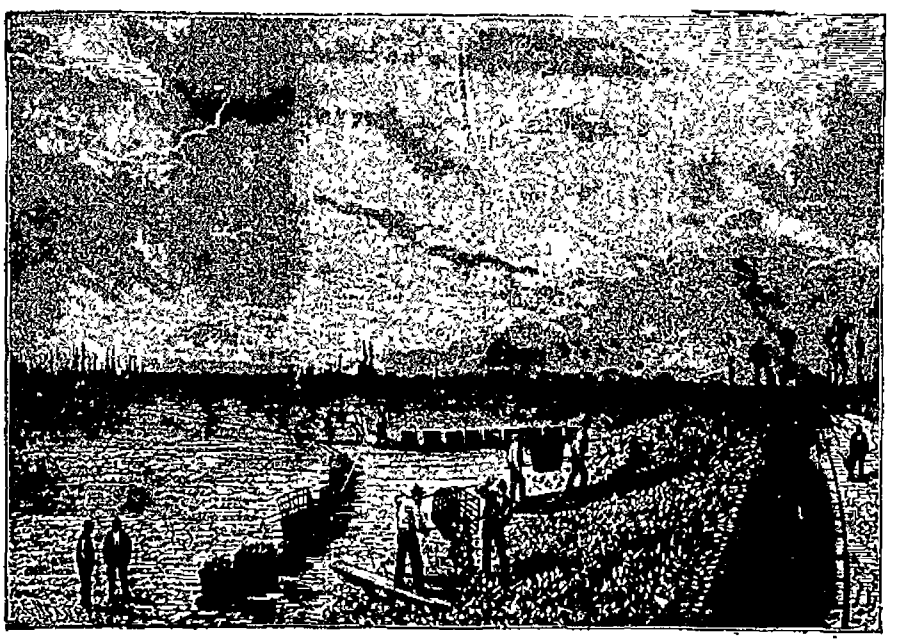
For **manual or animal power** the wagons are fitted with grease axle brackets (brass bushed) and compound chilled wheels.

STRONG PLATFORM WAGON, Type GG.—Generally similar to the above, but made stronger to stand heavy wear and tear.

This wagon is designed specially for **engineering establishments, foundries, and ironworks,** and for every description of compact, heavy traffic

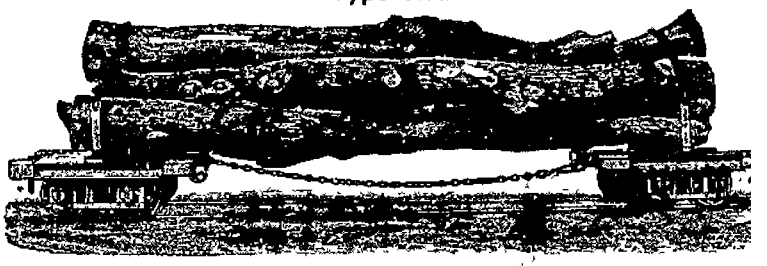
For use with **locomotive power,** and for Permanent Lines, we construct a Special Platform Wagon, **Type H,** fitted with central buffers and steel wheels, equal to a load of three tons, fitted generally same as type **EE,** described on page 42

The following engraving shows the Platform Wagons in use gathering crops (such as beet-roots, turnips, &c with light hand baskets for collecting and discharging the produce



BOGIES.—These are used for a variety of purposes, and, when coupled with a chain, as shown in illustration, **are very useful for moving lengthy articles,** such as timber, rails, girders, &c. When uncoupled they form handy trucks for any kind of goods. The frames are of **channel iron or steel,** with swivelling draw-gear; carried on steel axles, with grease axle boxes, springs, and wheels of iron or steel, according to the work and the gauge of track.

Type HH.

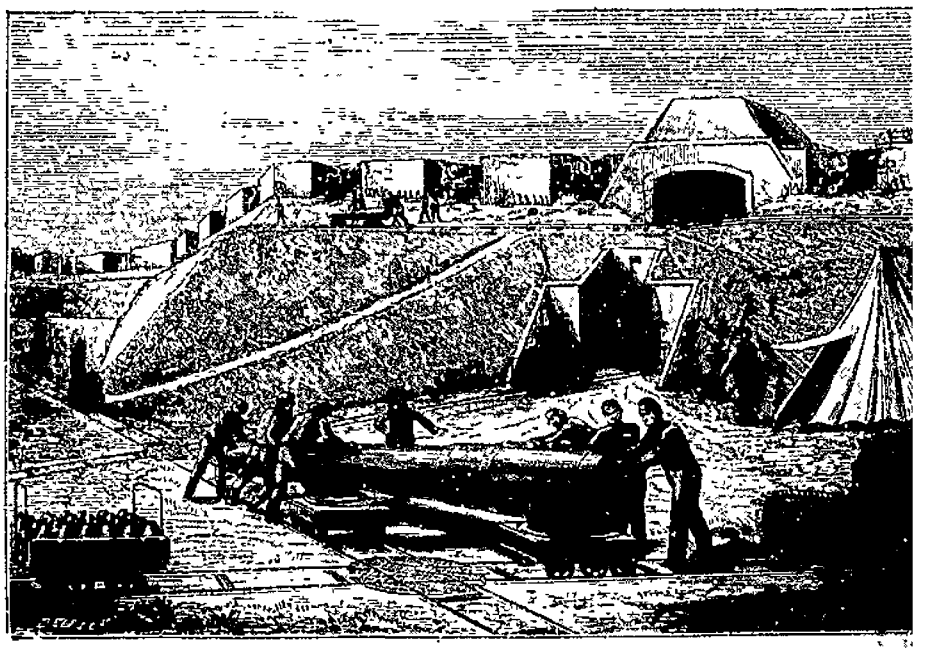


TIMBER WAGON, Type HH, is designed for carrying long timber from the forest to the saw mill.

Each bogie is fitted with an improved swivelling fork, which is arranged to move independently. These forks are provided with chains for securing the load, always leaving the bogies free; by these means the longest trees may be easily loaded, and may be transported over curves of small radii. The bogies are connected together by a suitable chain or rod of variable length to suit the load.

The same Wagon is used for carrying boilers, tanks, &c.

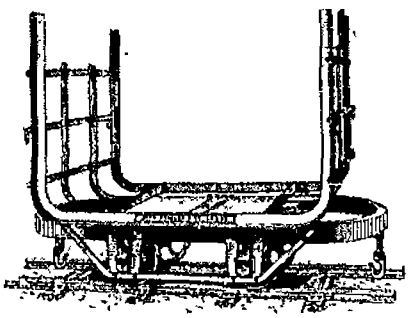
The following illustration shows these wagons as used for moving cannon, &c., in fortresses, arsenals, &c.



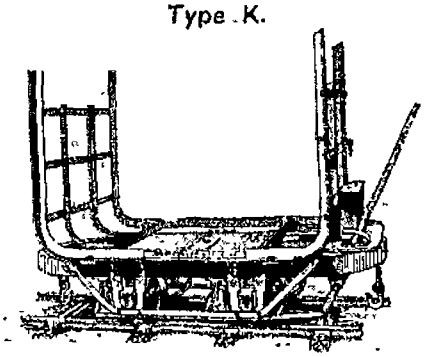
SUGAR-CANE WAGONS.—Wagons **Type J**, and **K** are made entirely of iron and steel. The frames are channel section, curved at ends, forming central buffers, fitted with swivelling draw-gear, steel axles, and grease axle boxes.

Type K is provided with a brake platform and tool box; the brake-gear is worked from this platform. We recommend one brake wagon to every five or six ordinary ones, and when inclines are steep, the number of brakes should be increased.

Type J.

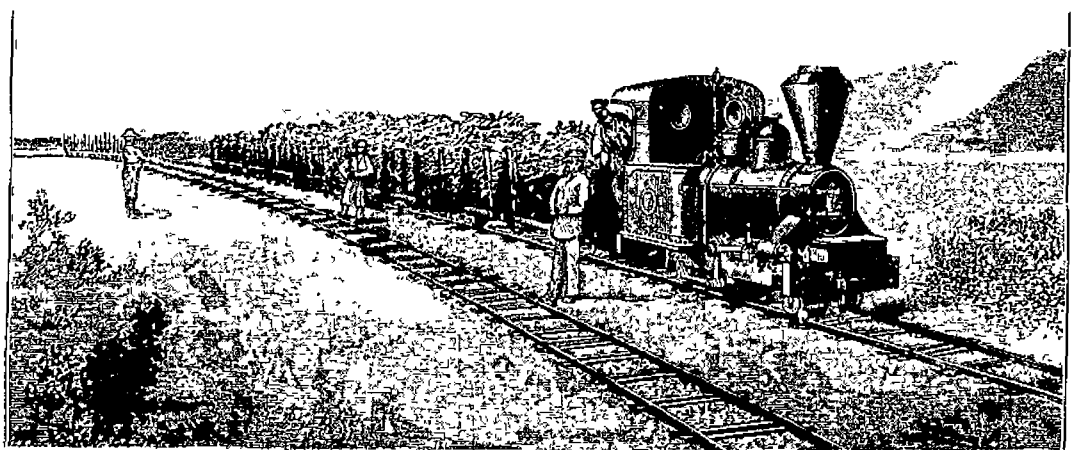


Type K.



These wagons, **Types J** and **K**, are already in extensive use amongst planters in the **East and West Indies**, the **Sandwich Islands**, **Philippine Islands**, and **Australia**, and are admitted to be the best of their kind.

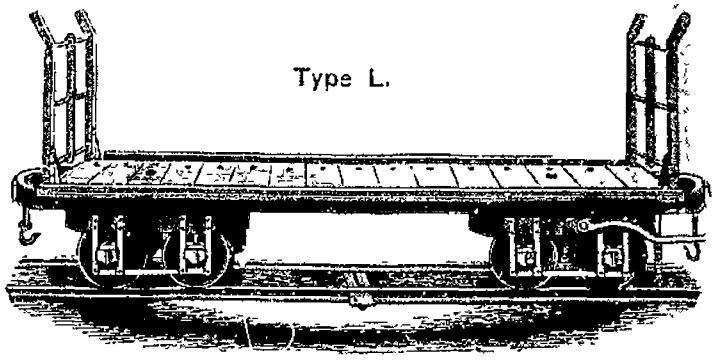
We also construct a **Light Sugar-Cane Wagon, Type JJ.** This is similar to those described above, but fitted with wood platform and movable wood posts, instead of the iron baskets, and is of lighter construction throughout.



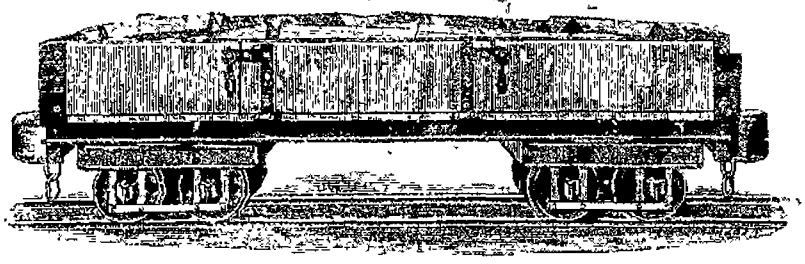
Advice and information as to the best means of gathering and transporting crops, will be furnished to our customers upon receipt of particulars of the estate

BOGIE SUGAR-CANE OR GENERAL PURPOSE WAGON, Type L. is specially **adapted for carrying bulky loads** on light railways, as owing to its great length the weight is distributed over a much larger surface; it will also travel round sharp curves. In cases where it is necessary to load the cane lengthway on the wagon, the ends may be dispensed with, and wood or iron side-posts substituted, let into sockets on the frame. The side frame can be arranged to receive two wrought-iron baskets (if preferred) similar to those shown for **Types J** and **K** *(see preceding page)*

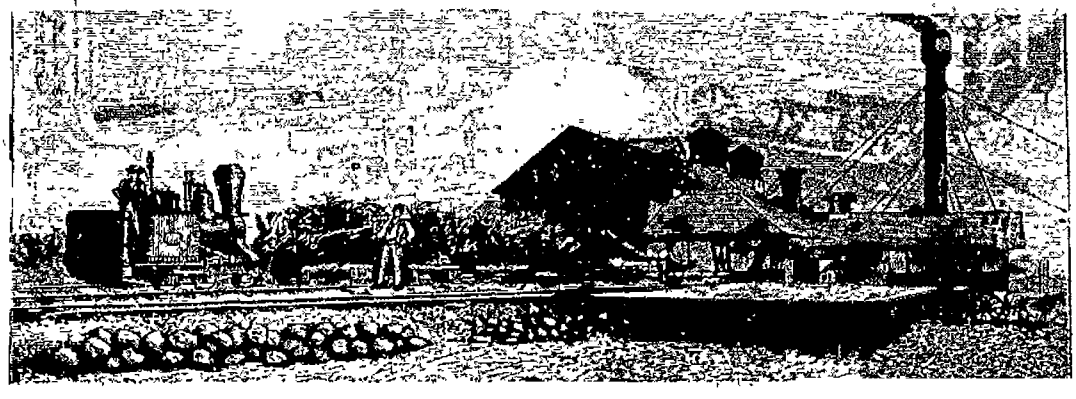
Type L.



Type LL.



OPEN GOODS BOGIE WAGON, Type LL, for carrying material not subject to injury from exposure. Brakes may be fitted to one or both bogies as required.

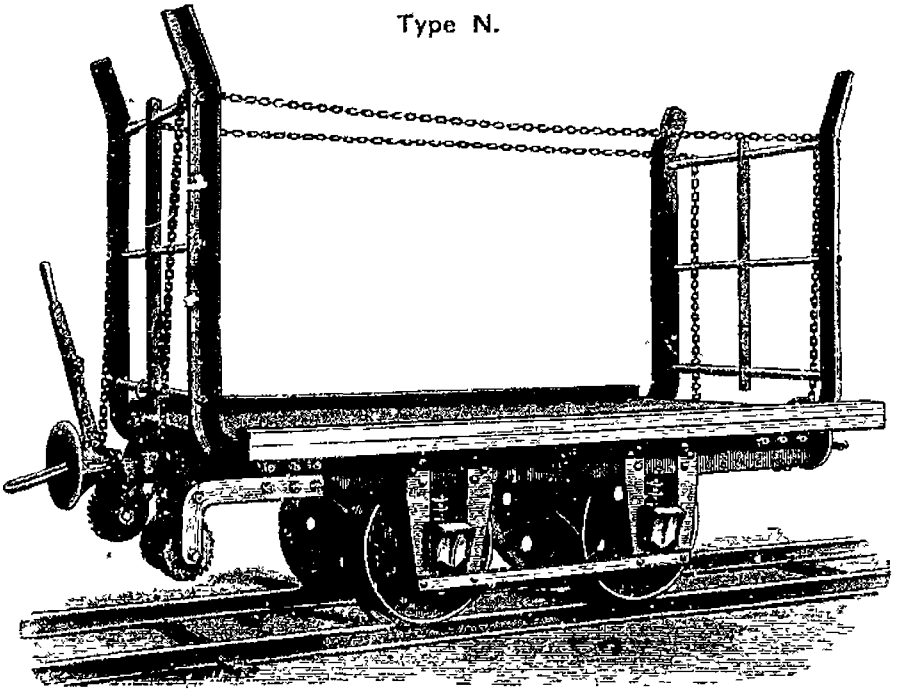


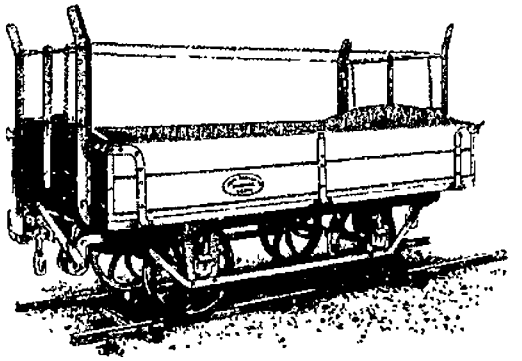
Plans of Sidings and Branch Lines, &c., *for Sugar Mills, with the* **best methods of feeding Cane Carriers, &c.,** *furnished to our customers free of charge.*

STRONG SUGAR-CANE OR GENERAL PURPOSE WAGON, Type N, for locomotive traction. It has extra strong channel-iron or steel frame, with draw-gear and central spring buffer at each end, steel axles, patent grease axle-boxes, springs, and steel wheels, double chains, barrels and ratchet gear for binding the load.

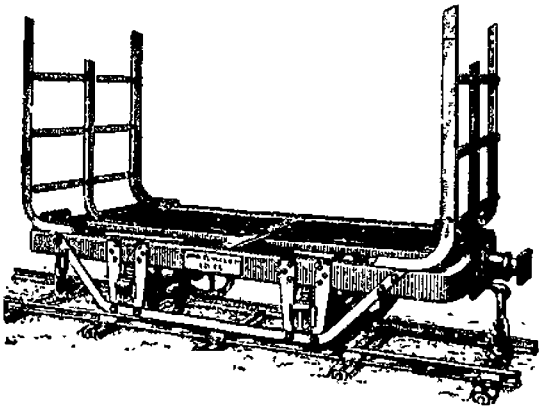
This wagon can also be fitted with brake-gear acting on all four wheels, driver's platform and tool box, similar to **Type K**, see page 46.

Type N.



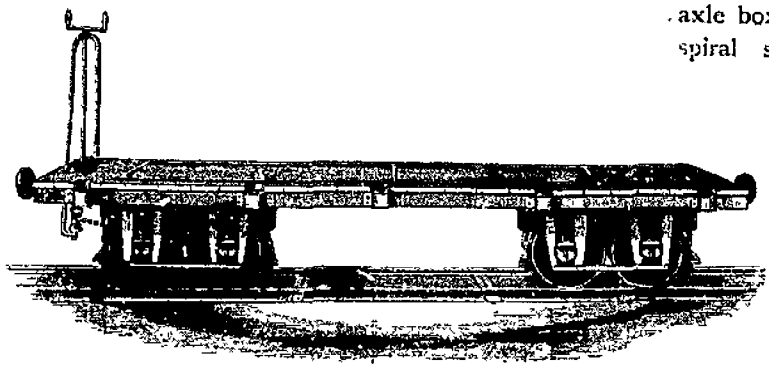


The **Type N** Wagon may be converted into a **Ballast Truck,** as shown by the engraving. During the construction of a railway it can be used for earthworks and goods transport, after which, the sides, &c., are removed, and it is used as a **Cane Wagon.** The hinge bands and ironwork only can be supplied (if preferred), and the woodwork may be of native timber, fixed abroad



This block shows the Wagon made as a simple **Sugar-Cane Carrier.** It is built of iron and steel throughout. Some hundreds of these trucks are working in Brazil, and giving every satisfaction.

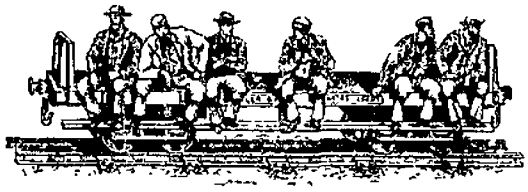
BOGIE GOODS WAGONS.—These wagons are constructed for carrying loads up to six tons weight, as by their length the weight is distributed over a much larger surface of the line. The use of bogies admits running freely on curves of small radii, and lengthy articles may thus be conveniently carried. We construct these wagons of three types, **"O" Bogie Platform Wagon, "O" Bogie Ballast Wagon, and "O" Covered Goods Wagon,** the under-carriages and frames being all of the same pattern. The frames are of channel iron or steel, with central spring buffers. The Bogies are fitted with steel axles, improved grease axle boxes, with gun-metal bush, spiral springs, and cast steel wheels, varying in diameter, according to the gauge.



Bogie Platform Wagon "O," with brake-gear, and wrought-iron sockets for movable wood posts

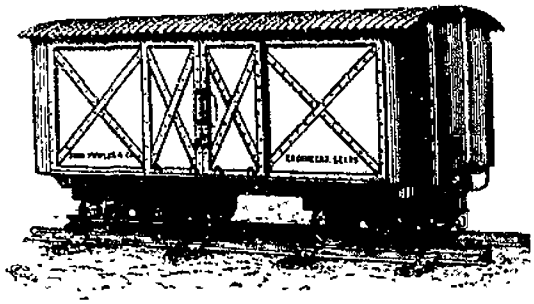
Type O (*Ballast Wagon*).

Bogie Ballast Wagon "O." military type, as made for H.M. Government War Department Suitable for every kind of heavy traffic. The side-boards are removable.



Bogie Ballast Wagon "O," military type (as above), converted into a transport trolley, the sides being used as footboards.

Type O (*Covered Goods Wagon*).

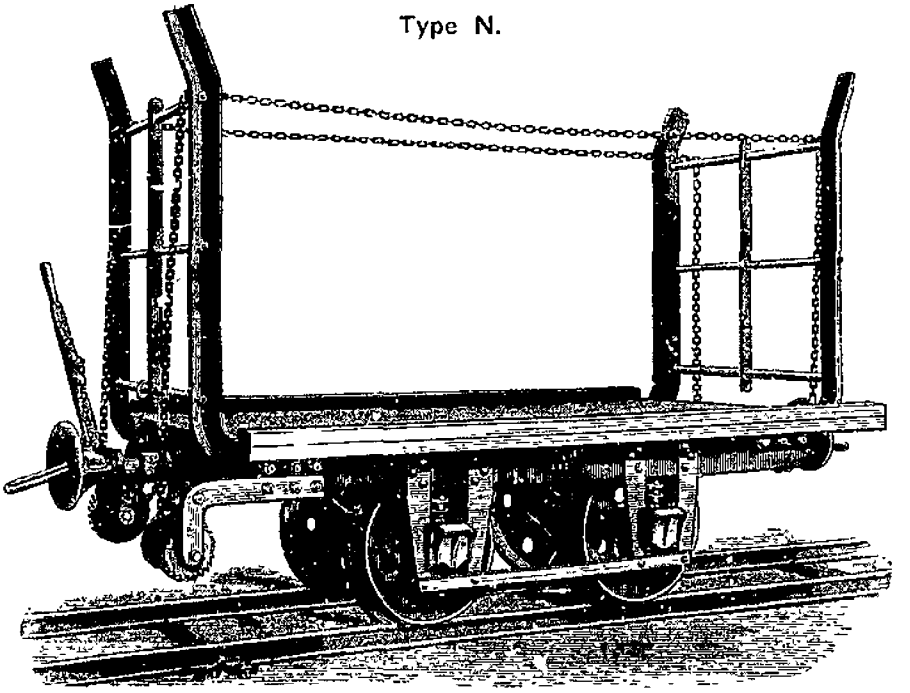


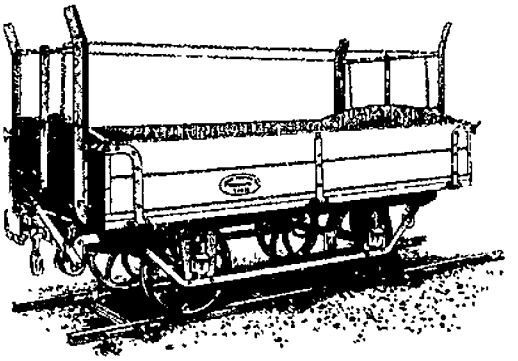
Bogie Covered Goods Wagon "O," with body of steel plates, and galvanised iron roof, sliding doors at both sides. The body may also be constructed in wood.

STRONG SUGAR-CANE OR GENERAL PURPOSE WAGON, Type N, for locomotive traction. It has extra strong channel-iron or steel frame, with draw-gear and central spring buffer at each end, steel axles, patent grease axle-boxes, springs, and steel wheels, double chains, barrels and ratchet gear for binding the load.

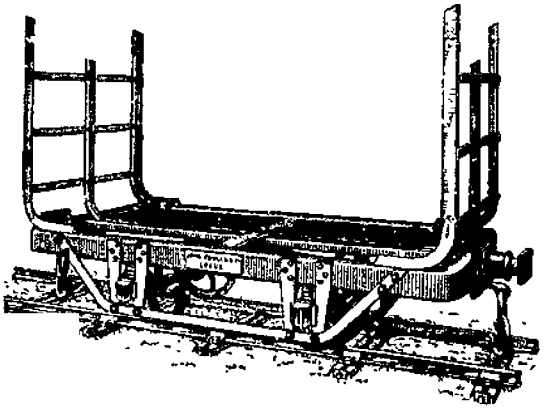
This wagon can also be fitted with brake-gear acting on all four wheels, driver's platform and tool box, similar to **Type K**, see page 46

Type N.





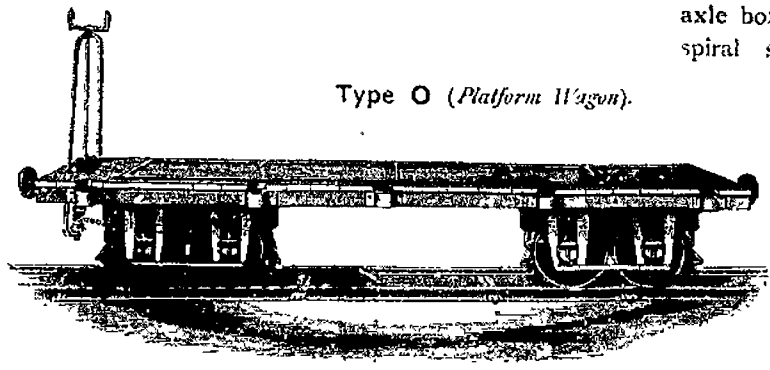
The **Type N** Wagon may be converted into a **Ballast Truck,** as shown by the engraving. During the construction of a railway it can be used for earthworks and goods transport, after which, the sides, &c., are removed, and it is used as a **Cane Wagon.** The hinge bands and ironwork only can be supplied (if preferred), and the woodwork may be of native timber, fixed abroad.



This block shows the Wagon made as a simple **Sugar-Cane Carrier.** It is built of iron and steel throughout. Some hundreds of these trucks are working in Brazil, and giving every satisfaction.

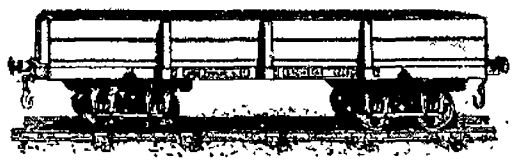
BOGIE GOODS WAGONS.—These wagons are constructed for carrying loads up to six tons weight, as by their length the weight is distributed over a much larger surface of the line. The use of bogies admits running freely on curves of small radii, and lengthy articles may thus be conveniently carried. We construct these wagons of three types, **"0" Bogie Platform Wagon, "0" Bogie Ballast Wagon, and "0" Covered Goods Wagon,** the under-carriages and frames being all of the same pattern. The frames are of channel iron or steel, with central spring buffers The Bogies are fitted with steel axles, improved grease axle boxes, with gun-metal bush, spiral springs, and cast steel wheels, varying in diameter according to the gauge.

Type O (*Platform Wagon*).



Bogie Platform Wagon "0," with brake-gear, and wrought-iron sockets for movable wood posts

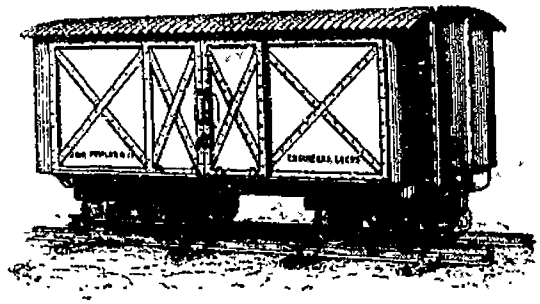
Type O (*Ballast Wagon*)



Bogie Ballast Wagon "0," military type, as made for H.M. Government War Department Suitable for every kind of heavy traffic. The side-boards are removable.

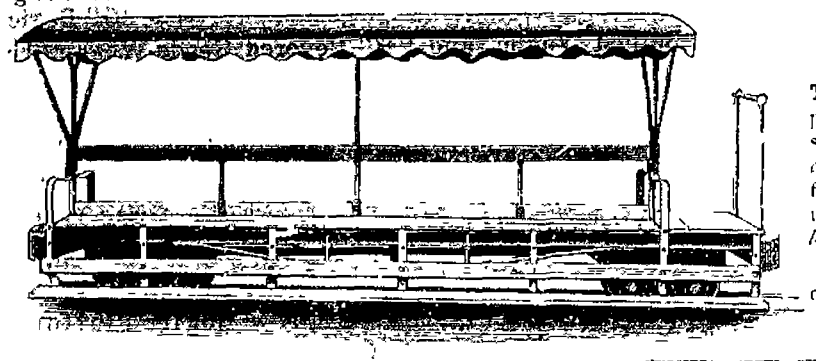
Bogie Ballast Wagon "0," military type (as above), converted into a transport trolley, the sides being used as footboards.

Type O (*Covered Goods Wagon*).



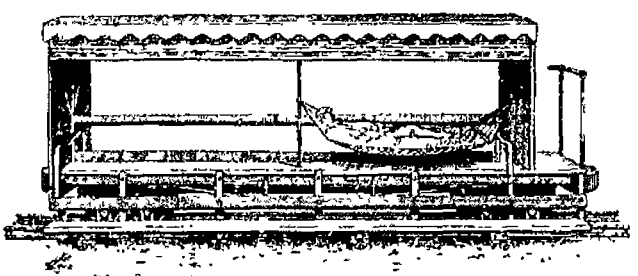
Bogie Covered Goods Wagon "0," with body of steel plates, and galvanised iron roof, sliding doors at both sides. The body may also be constructed in wood.

PASSENGER CARS.—The following are the types of Passenger Cars and Trolleys w supply for private lines and for districts in which there is only a small passenger traffic. They are built on channel iron or steel frames, with steel axles, grease axle boxes, and springs. They may be fitted with brake-gear, and driver's platform at one or both ends, accommodating the guard and driver.

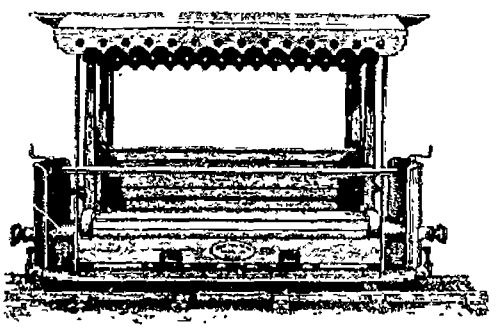


Open Passenger Car, Type M, to carry twenty persons, with lath and space seats awning of *tar proof canvas* side blinds may be fitted to this car, to roll up under the roof for use in *bad weather*

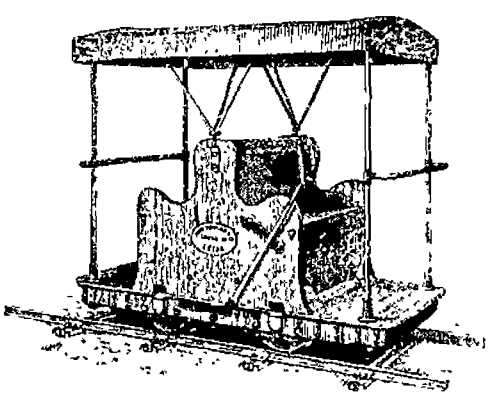
Driver's platform at one or both ends, as preferred.



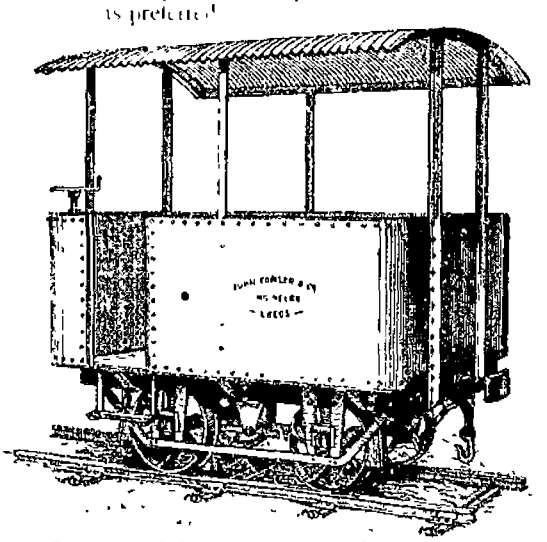
Passenger Car, Type M, converted into Ambulance car; the ends are boarded up, and side blinds are fitted in also fastenings for hammocks, &c



Four-wheeled Open Car, to carry ten or twelve persons, the driver's platform and brake gear may be put at one or both ends as preferred

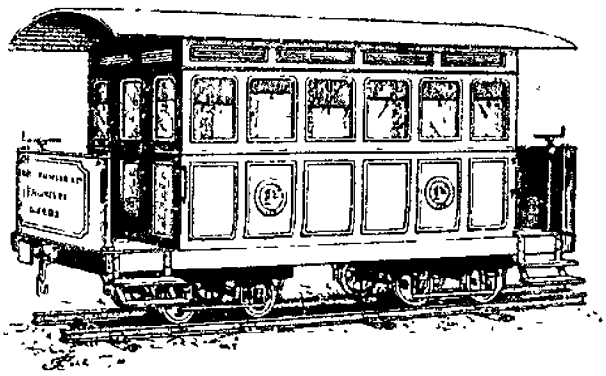


Inspector's Trolley (for hand shunting or animal traction, as preferred), to carry four or six persons. Fitted with double hand brake



Passengers' Luggage and Brake Van, built of steel plates (or wood), with roof of galvanised iron brake gear acting on all wheels. This is a useful van, and should be run with every train, especially where locomotives are used

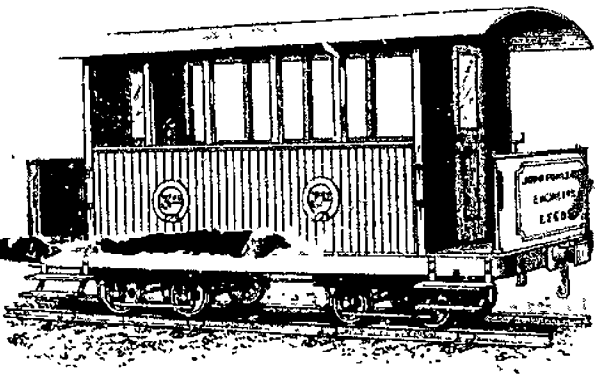
BOGIE PASSENGER CARS.—The following Passenger Cars are the types we recommend for regular traffic on permanent lines. They are built on channel-iron or steel frames, with steel axles, grease axle boxes, and springs; steel wheels, central spring buffers, and coupling gear of approved type. Fitted with screw brake-gear, and driver's platform at both ends

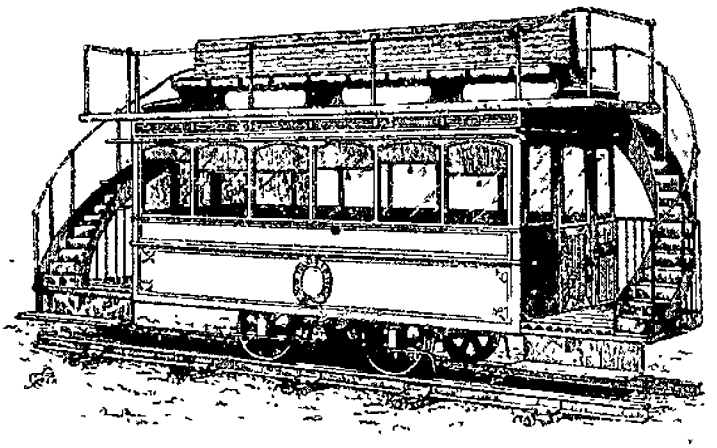


First or Second Class Car, to carry sixteen to twenty persons, with sliding lights and Venetian shutters, interior got up in first-class style, perforated or upholstered seats, to suit customers' requirements

This may also be made as a **Composite Car,** if required.

Third Class Car, to carry twenty persons; the seats formed of laths, boarding up the sides to middle height; open lights, and awning of canvas, wood, or galvanised iron, as preferred

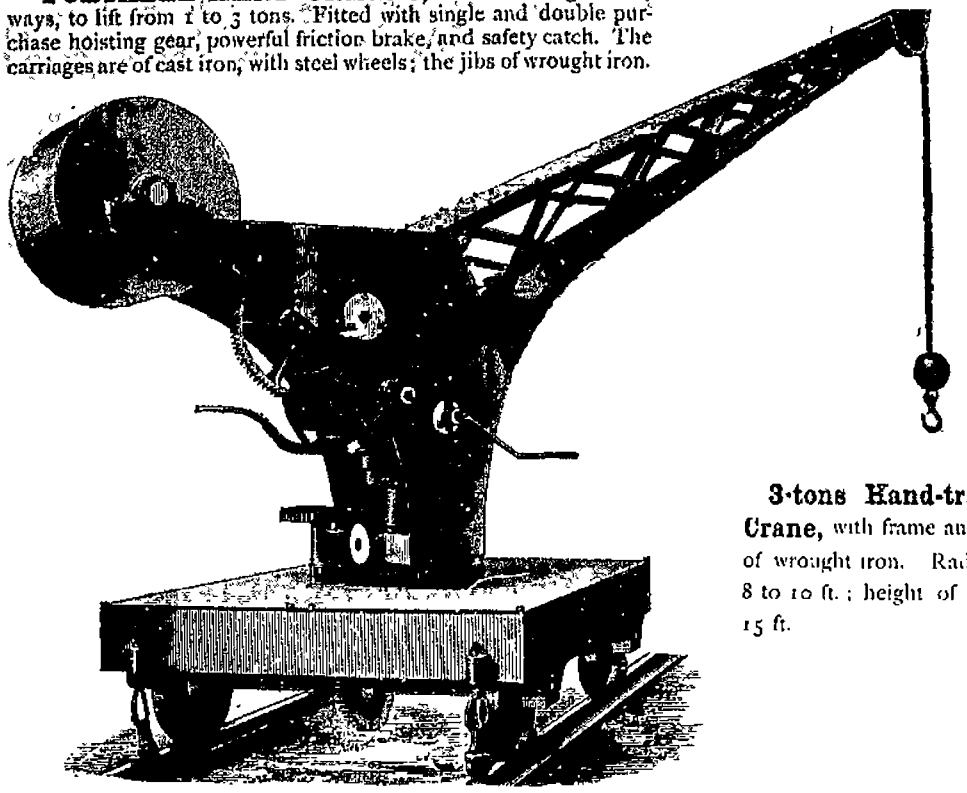




Tram Car, with outside seats, for city traffic; sliding lights and Venetian shutters, upholstered to suit customers wants. May also be made without roof seats.

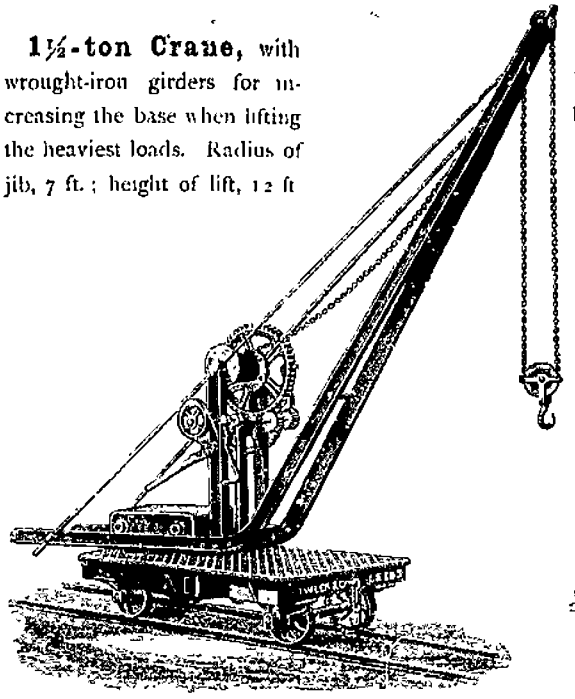
Every description of Passenger Car, or ironwork and fittings for same, designed and estimated for, to meet the wants of our clients.

PORTABLE HAND CRANES, for use on Light Railways, to lift from 1 to 3 tons. Fitted with single and double purchase hoisting gear, powerful friction brake, and safety catch. The carriages are of cast iron, with steel wheels; the jibs of wrought iron.

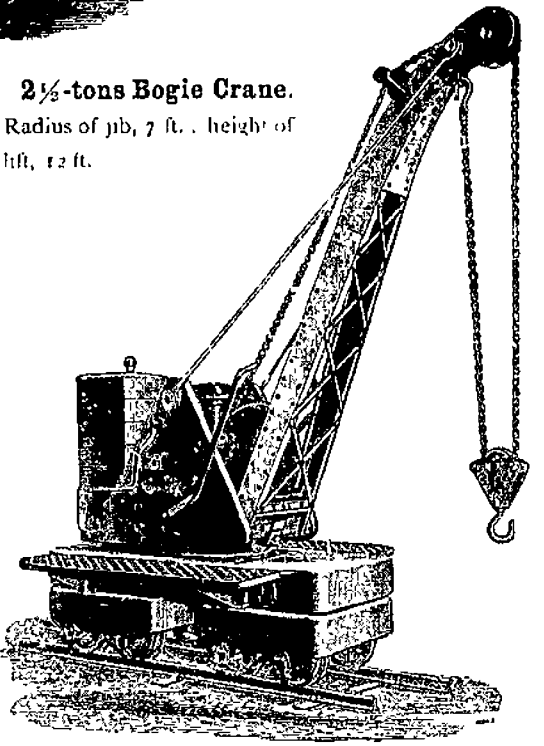


3-tons Hand-travelling Crane, with frame and platform of wrought iron. Radius of jib, 8 to 10 ft.; height of lift, 12 to 15 ft.

1½-ton Crane, with wrought-iron girders for increasing the base when lifting the heaviest loads. Radius of jib, 7 ft.; height of lift, 12 ft



2½-tons Bogie Crane. Radius of jib, 7 ft.; height of lift, 12 ft.



Estimates given for every kind of Lifting Tackle on receipt of the necessary information.

WAGON DUPLICATES.

THE several parts of our wagons are made **to gauge and template,** and duplicates may be supplied, which will be found **interchangeable** with the parts when broken, lost, or worn out

To avoid loss of time, we recommend our friends to order **a stock of duplicates** to be sent out with their wagons, and a list is here given of what we advise for 50 wagons. Subsequently, should any additional parts be required, they can be forwarded immediately.

The various castings bear a number or pattern mark, and it will avoid delays and mistakes if our customers will give this mark when ordering duplicates. As this is a matter of **considerable importance to users of rolling stock,** we would urge our friends not to overlook it.

LIST OF DUPLICATES

FOR

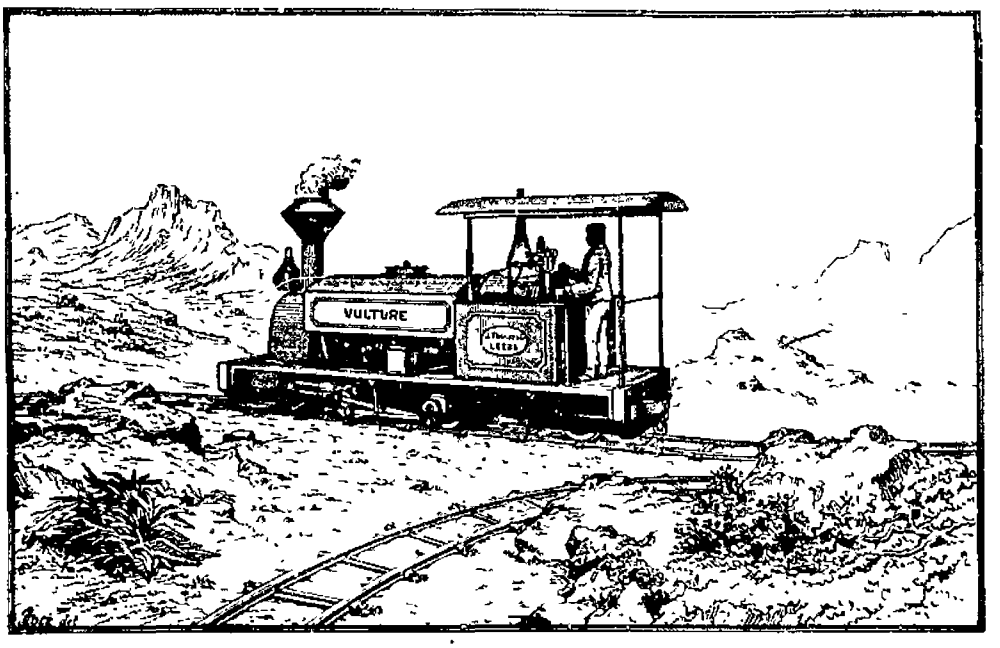
FIFTY 4-WHEELED WAGONS OR BOGIES.

Pairs of wheels and axles	6	Sponges	20
Axle boxes complete, with bush, lid, and keep	10	Brake blocks	10
Extra lids	20	Spring buffers, complete	10
Extra keeps	20	Buffer springs	10
Extra bushes	60	Ratchet pinions and drums for binding loads	10
Spiral springs	20	Draw chains for horse traction	10
Spring studs	10	Assorted bolts, nuts, and rivets	2wt.

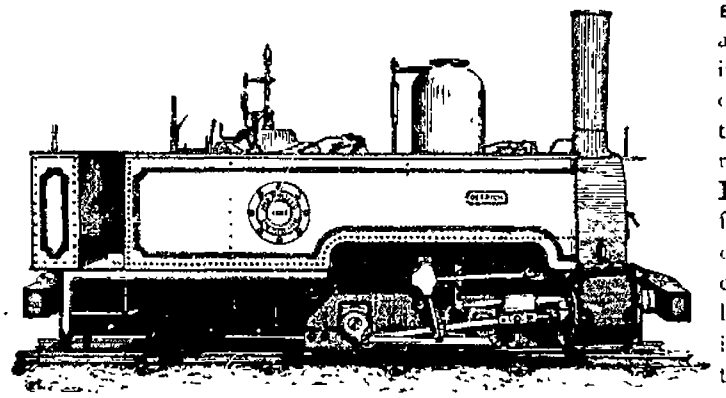
All Castings bear Pattern Mark.

NARROW GAUGE LOCOMOTIVES.

IN all cases where the traffic is constant, or of considerable weight, **Locomotive Engines** are found to be **more economical than animal power.** One of the drawbacks, however, to their general adoption, lies in the fact that in most cases light railways are badly laid, or where well laid in the first instance have been allowed to get out of order, rendering it difficult to keep an ordinary rigid Locomotive on the road To overcome this difficulty, we have designed a special engine in which a **large amount of flexibility is given to the**

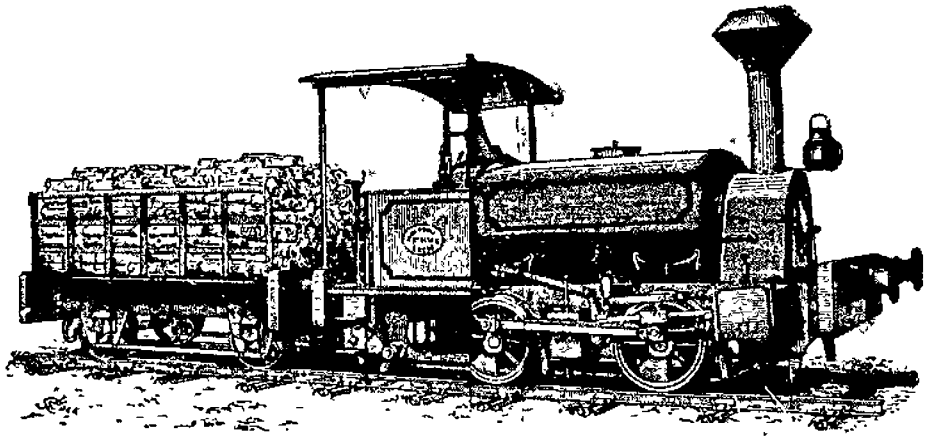


wheel base, enabling the engine to not only keep on the metals but to haul a heavier load, and with less strain on itself Steel and wrought-iron are used wherever practicable in the construction of these engines, the boilers are of the best mild steel, with copper fire-boxes and brass tubes, the wheels have steel tyres. The valve gear is Joy's Patent, which greatly **simplifies the motion work,** and reduces the number of wearing parts The motion is all outside the frames, and is easy to get at for lubrication or repairs, **without placing the Engine over a pit.** We manufacture these engines either with or without a bogie, but in all cases where the lines are roughly laid, and steadiness in running is desired, we recommend that the bogie be adopted



NARROW GAUGE COMOTIVES—*continued.*

The following illustration shows our standard type of **4-wheeled Engine**, with fuel Tender. The Tender may be made as a Water Tank also, if preferred.

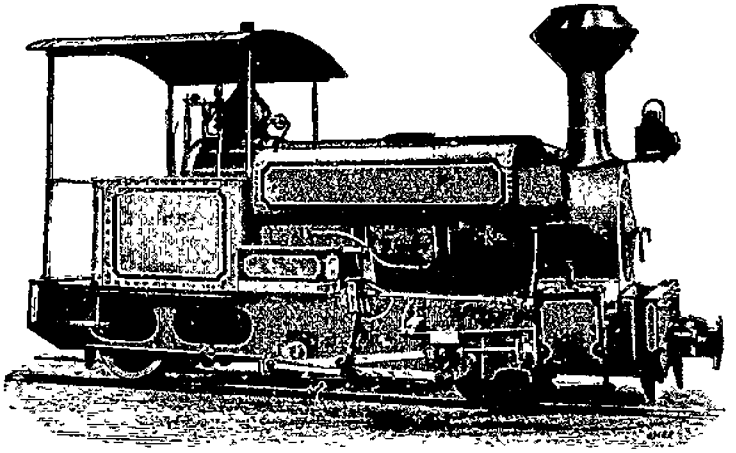


The annexed table gives the leading particulars of our standard sizes of Locomotives. The approximate weights given are for engines with bogies, engines on four wheels only, will be somewhat lighter

Cylinders, Diameter		5 in.	6 in.	7 in.	8 in.	9 in.
" Length of Stroke		9 in.	10 in.	12 in.	12 in.	14 in.
Coupled Wheels, Diameter		20 in.	24 in.	24 in.	24 in.	30 in.
Coupled Wheel, base		2 ft. 6 in.	3 ft. 0 in.	3 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.
Total Wheel Base		6 ft. 6 in.	7 ft. 6 in.	7 ft. 6 in.	8 ft. 10 in.	8 ft. 10 in.
Tank capacity	in gallons	100	120	150	200	250
Coal Bunker capacity	in cubic ft.	10	10	12	15	18
Weight Empty	in tons	4	5¾	7¼	8	9¼
Gauge	in inches	18 to 30	18 to 30	18 to 30	24 to 30	30 to metre

STANDARD LOCOMOTIVE

(4 COUPLED WHEELS AND 2-WHEELED BOGIE).



DUPLICATE WARING PARTS

LOCOMOTIVES.

THE details of our Locomotives are all **made to gauge and template,** and duplicate parts may be supplied which will be found interchangable.

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We advise purchasers of Locomotives (especially when intended for export) to order the following set of duplicate wearing parts, which have proved sufficient to meet all ordinary contingencies.

LIST OF DUPLICATES

ONE NARROW GAUGE LOCOMOTIVE.

Driving wheels	2	Back cylinder cover	1
Bogie wheels	2	Piston complete, with springs and rings	1
Bogie spring	1	Brass piston rings	4
Axle boxes complete, suitable for driving and trailing wheels	2	Brass slide valves	2
		Sets fire bars	2
Set of brasses for driving, trailing, and bogie axle boxes	1	Boiler tubes	6
		Ferrules for same	12
Set of bushes for connecting and coupling rods	1	Fusible plugs	4
		Water gauge glasses	6
Radius dies for Joy's valve gear	2	Rings for same	12
Front cylinder cover, with gland and studs	1		

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The Catalogue of our Manufactures *is divided into four parts, and we shall be glad to forward any one or all of these to our clients on receiving their request to that effect.*

PART I.—**STEAM PLOUGHING ENGINES** *for Single and Double Engine Systems and Agricultural Implements for working with same, Water Carts, and Ropes.*

PART II.—**TRACTION ENGINES** *for General Purposes and for Road Haulage, Steam Road Rollers, Combined Traction Engines and Locomotives, Traction Engines and Cranes, and Traction Engine Wagons.*

PART III.—**PORTABLE and SEMI-FIXED ENGINES,** *Compound and Single Cylinder; Stationary Engines, and Boilers of every type; Sugar Mills, Underground Hauling and Pumping Engines, Winding Drums and Ropes, Pit Head Gears, Contractors' and Colliery Locomotives.*

PART IV.—Patent Portable and Semi-Portable Railways, Light Railway Plant, and Rolling Stock.

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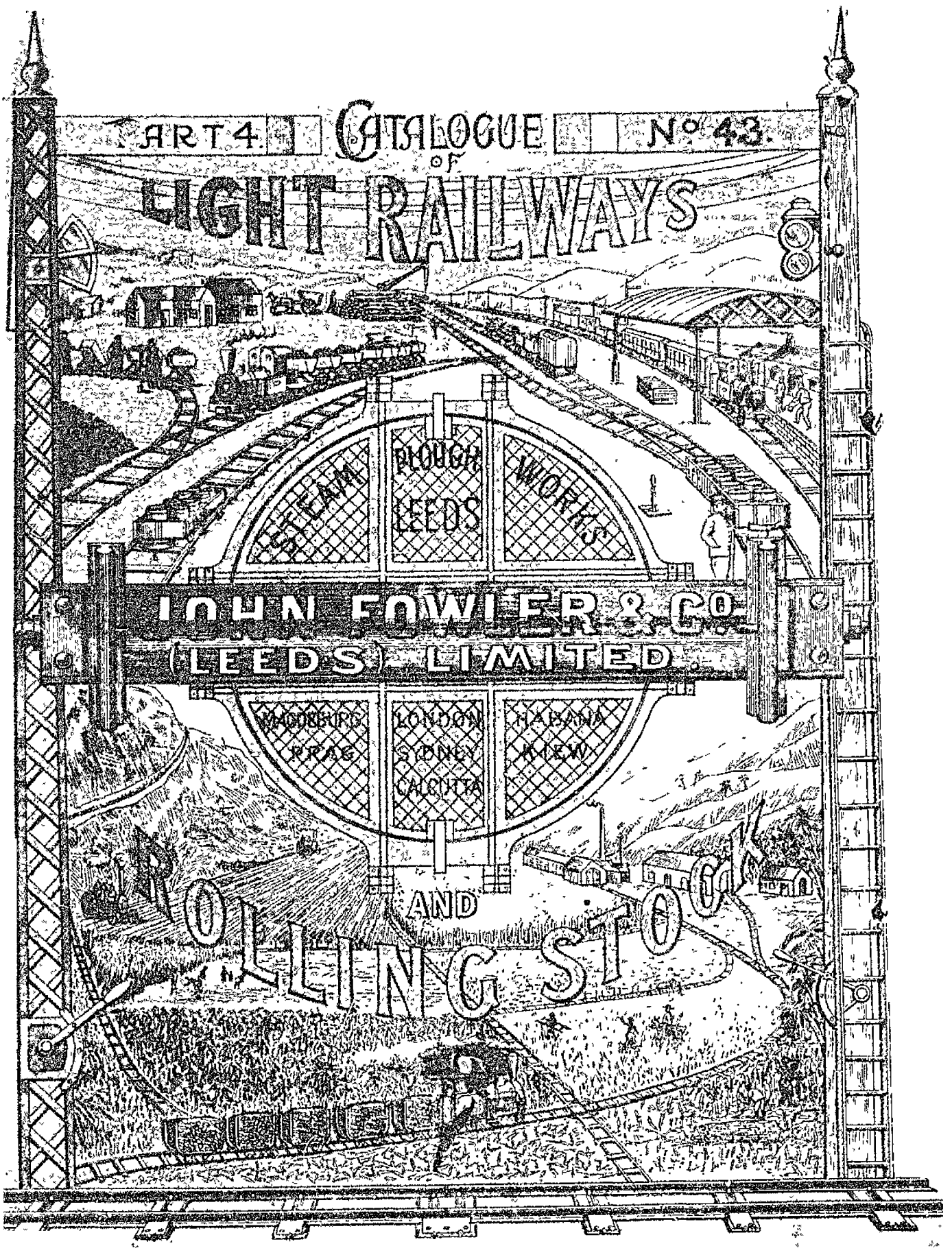
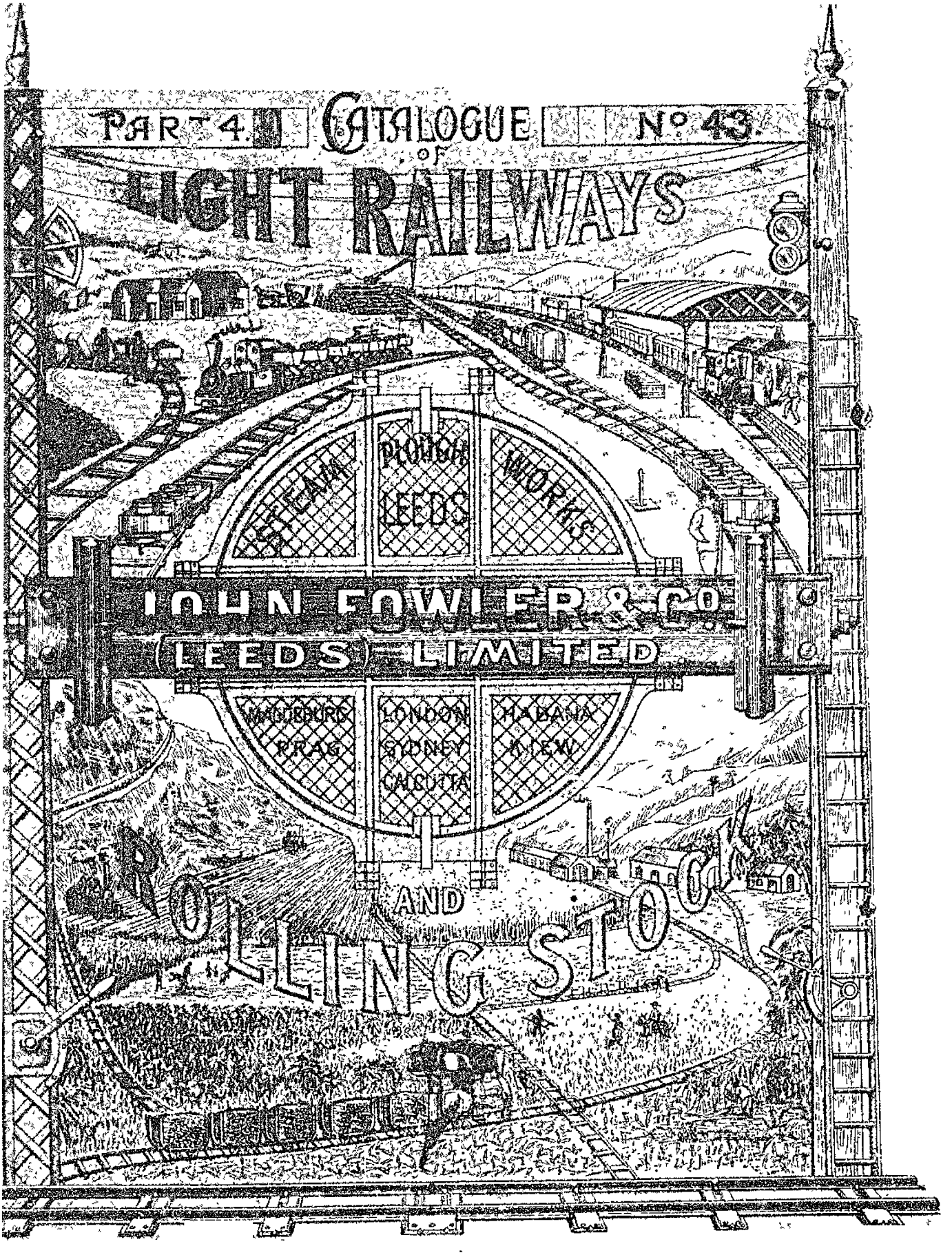
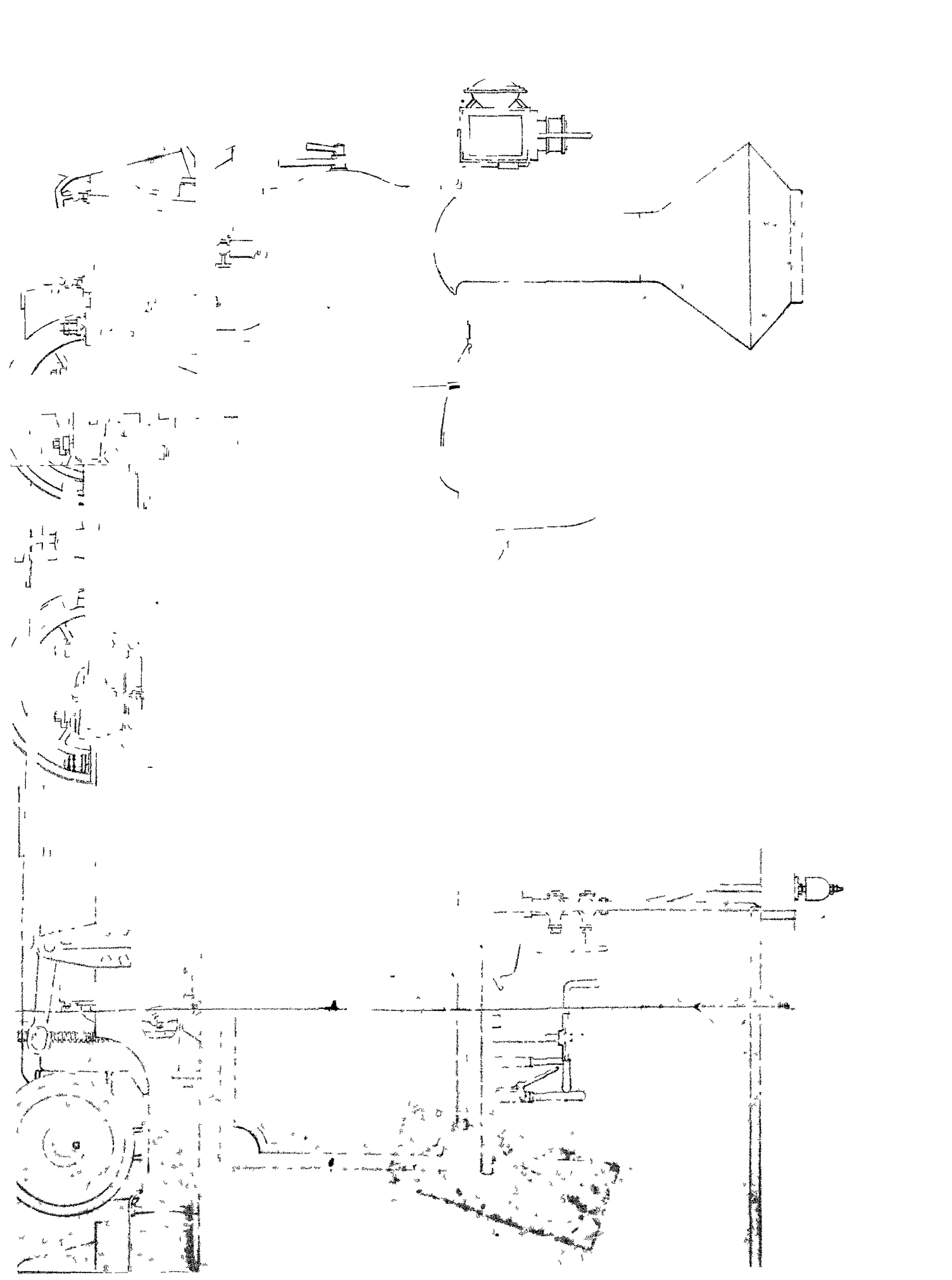
LIGHT RAILWAYS

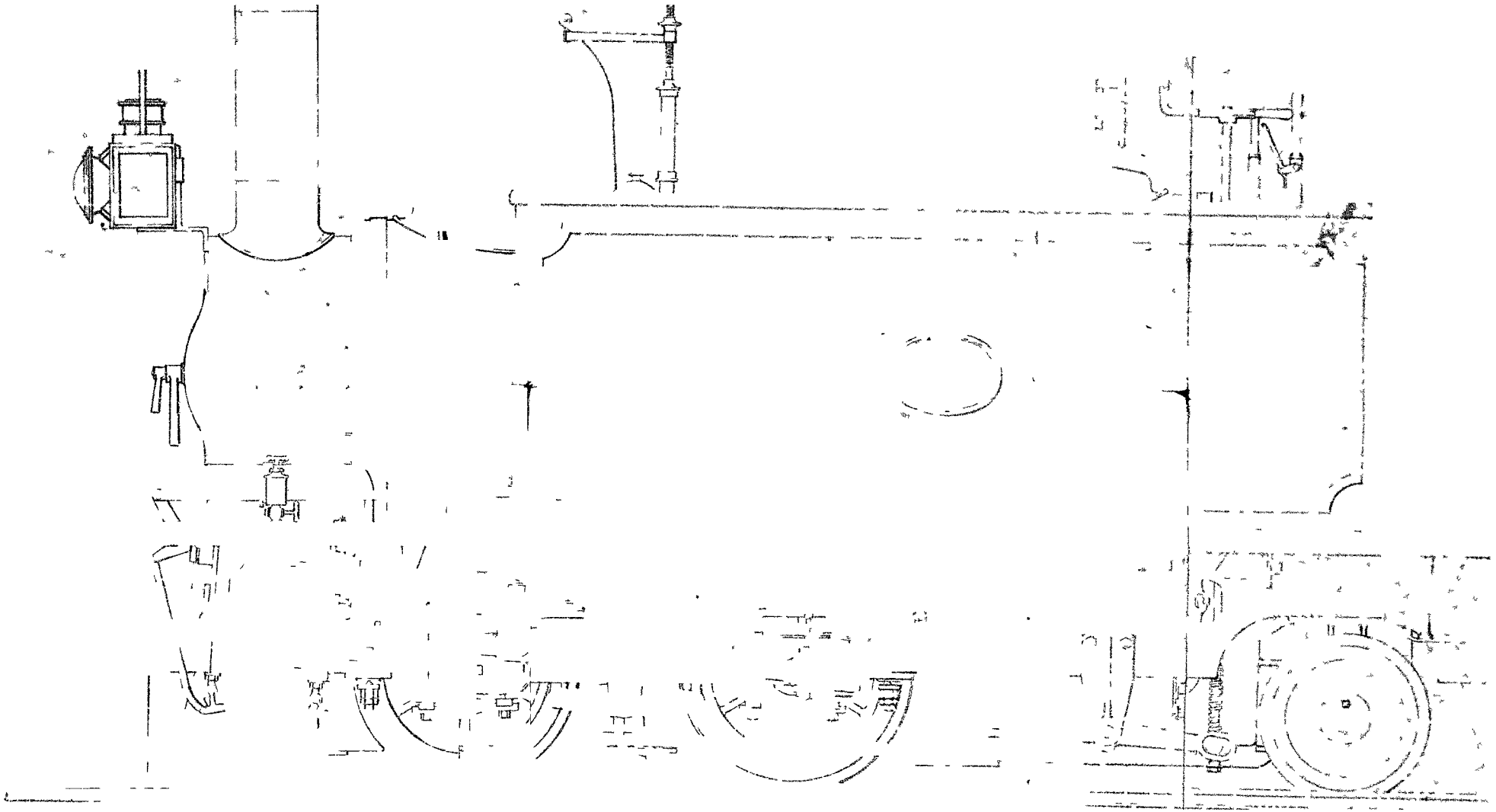


PART 4. CATALOGUE OF No. 43.

LIGHT RAILWAYS



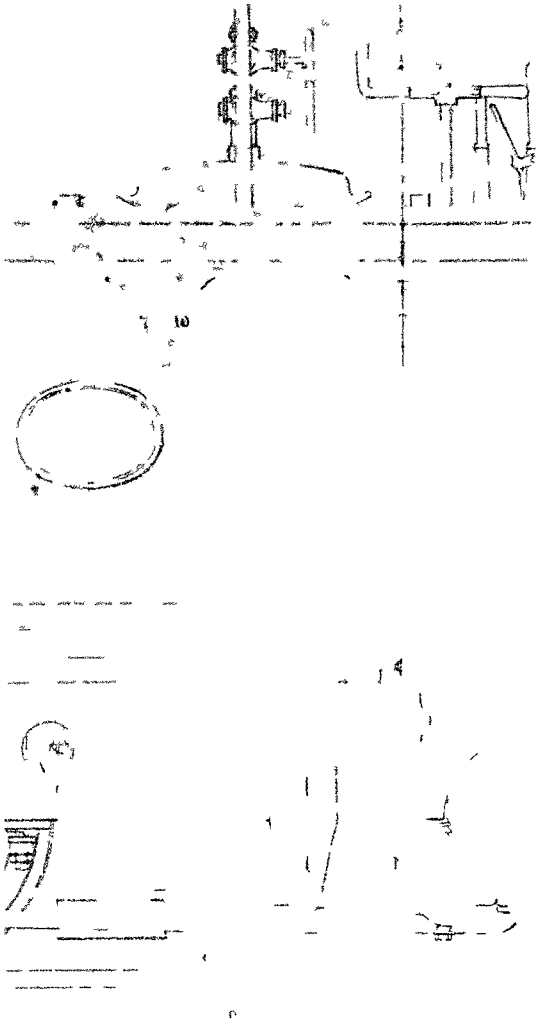


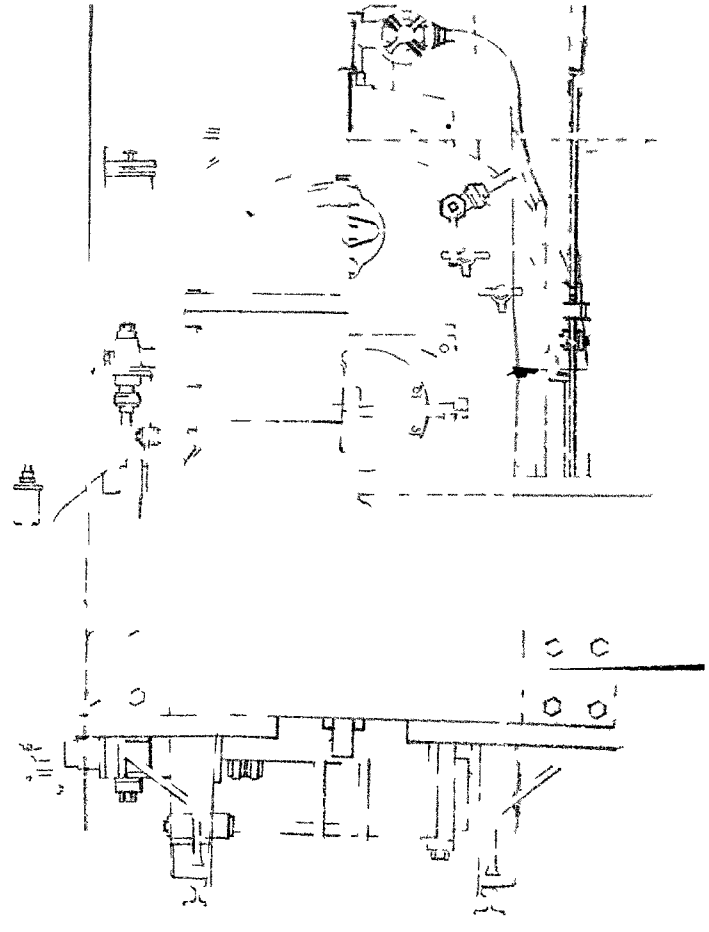


ARRANGEMENT OF 7"×12" TANK LOCOM

JOHN FOWLE
ENGI

SCALE 1 INCHES = 1 FOOT





ARRANGEMENT O - 7"×12" TANK LOCOMOTIVE FOR 2ft" GAUGE

JOHN FOWLER & Co
ENGINEERS
LEEDS

DRAWING № 29026

No. 2916
ENCLOSURE TO
Postal Calcutta

ENCLOSURE 10

— FOUR-WHEEL— 3ᵈ CLASS — CAR —

— FOUR-WHEEL— 1ˢ CLASS — CAR —

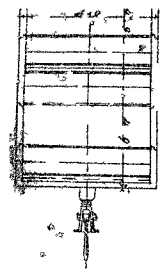
— MCC N°1 —

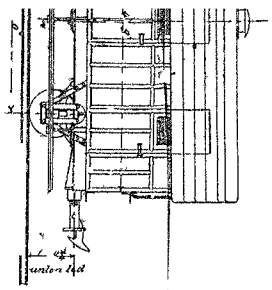
— TRAM CAR WITH TOP SEATS —

— MCC N° 5

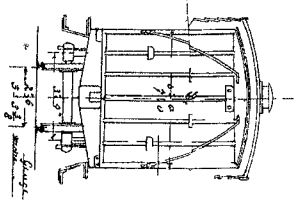
— TRAM AG WITH IN ID

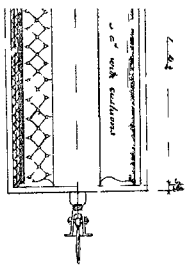
FOUR WHEEL BRAKE VAN —

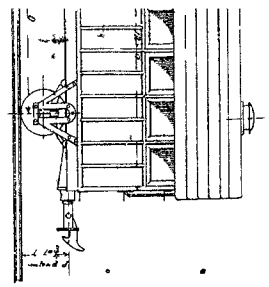




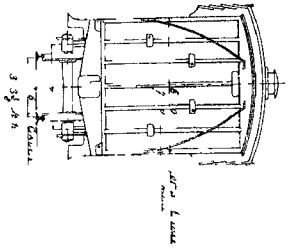
— 3rd CLASS — CAR —





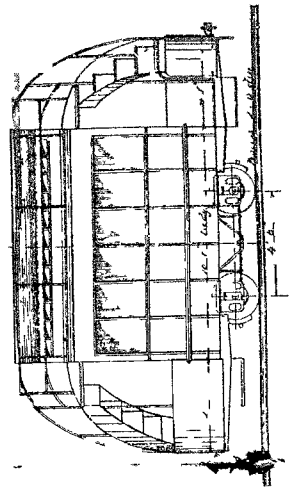


— 1st CLASS — CAR —



— MC N° 2 —

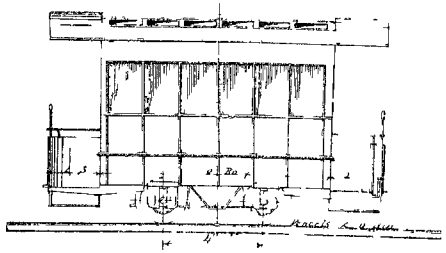
— TRAM CAR WITH TOP SEATS —

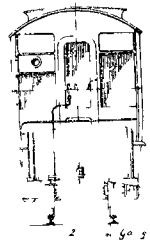


— MC N° 4 —

— TRAM CAR WITH INSIDE —

— Scale 4 mm to 1 foot —

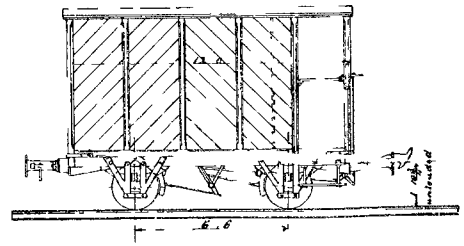


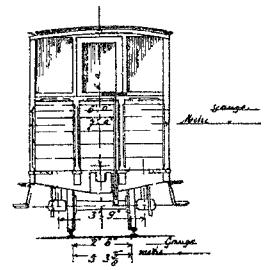


— JOHN FOWLER & C° (LEEDS) LIMITED — ENGINEERS —

— MC N° 5 —

— FOUR WHEEL BRAKE VAN —





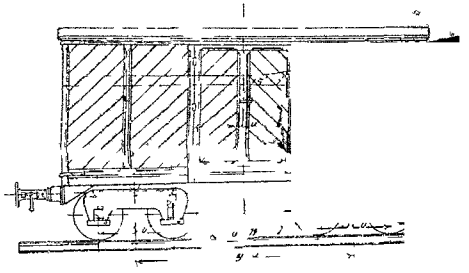
— JOHN FOWLER & C° (LEEDS) LIMITED — ENGINEERS

STEAM PLOUGH WORKS — LEEDS —

AND 61 QUEEN VICTORIA STREET — LONDON —

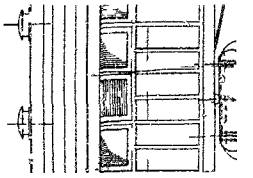
BOGIE COVERED — GOODS — WAGON

Scale 4 feet to 1 foot



MCC N° 6

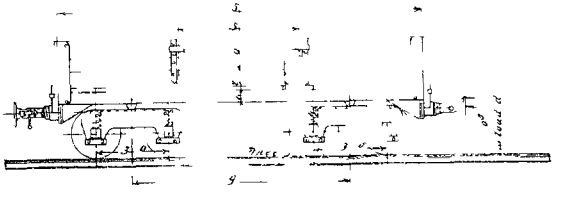
1st & 2nd CLAS

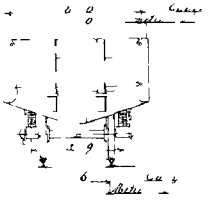


JOHN FOWLER & C LEEDS

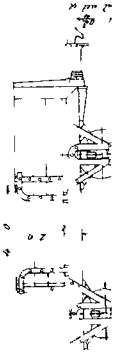
AN GLOMBARD STREET LONDON

MCC N° 7





RWF JUNCTION WAN-



— JOHN FOWLER & C° (LEEDS) LIMITED — ENGINEERS —

— STEAM-PLOUGH WORKS — LEEDS —

— MCC N°10 —

LIMITED — ENGINEERS —

— STEAM PLOUGH-WORKS — LEEDS —

AN GLOMBARD STREET LANE

— LOODS — WAGON —

MCC N°7

LIMITED — ENGINEERS —

— STEAM-PLOUGH-WORKS — LEEDS

— FOUR WHEEL OPEN — GOODS — WAGON —

— JOHN-FOWLER & Cª (LEEDS) LIMITED — ENGINEERS

— COODS — WAGON — — —

4094.

Proposed North Kanara Forest Railway.

Letter from the Conservator of Forests, C.C., No. 4550, dated 25th January 1888 = Reporting with reference to Government Memorandum No. 11470, dated 3rd November 1887, that Messrs Bell and Oliver, Assistant Conservators of Forests, have been directed to collect the data necessary for the preparation of a working-plan of the forests which would be tapped by a railway between Hagargali and Sunda; and making remarks

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Subd. with reference to para 2 of the minute by the Hon. Mr. Pinhey of 31st Oct. 1887 among the Loose papers put up

NW 7/2 81488

Trans. Collr. P.W. Depts. Rails for note by the Consulting Engrs. on Mr. Macpherson's suggestion. With reference to the forest question Mr. Macpherson thinks that firewood will be produced free of cost (as firewood) by the preparation of timber, sleepers &c in Sirsi, while it will mean clearing (as fuel wood) over the line. Would Mr. Crimpton be able to load firewood at any point on the line or make it [illegible]? 7/2/88

Consulting Engrs. 10/2/88

Mr. Macpherson 7/2/88 (to be returned).

RECD
MAR.
1888

Earl Grey

I had an opportunity of discussing this matter with Mr Macgregor at Balgownie only a few days after he had written the letter, & it is probable that had I seen him a week earlier this letter would have assumed a very different complexion to what it did

The work estimated for would include the protection of the river banks opposite the Town, the construction of a Bridge of communication with the Russell Town & the construction of a 2 ft gauge line. The surveys now being made are for a wrought iron "Fowler" system, giving a good bank angle but strong timber bridges with jungle wood sleepers have to be used. The natives also claim that the grounds on the embankment as far as possible in front of the town

as I think all the Manchester objections on the question of adjustment & permanency were met by further considerations

The question of gauge was of course always a disturbing element but I don't think the Manchester arguments can be allowed to have much weight, when the S. & N. W. took such a wide interval as 5'6" gauge the question would resolve itself into a question of difference & then it would be a fair question to consider whether or not 2.6" & 2.0" gauge

But the main line of the Manchester argument against the Narrow gauge was the difference between the almost wholly up-hill & down-hill way the Manchester engineers assumed that a width of 4 ft. 6 ins. will suffice for a 2 ft. gauge line 12 ft. as suggested for a narrow line would mean heavy cuttings & would mean an extra cost of 2 or 3 thousand £ per mile. The cost of the track will also be

that if a line is easily drawn
parallel to the axis of the parabola
and a little within the same
to cut the curve in two points
if one is theoretically a 2d. ge
should a gen. a smaller section
of the same kind than a mch-gen
but in, practice it cannot be given
it is to small a distance, &
in Engineering they ask afterwards to
have cut a tenon & keep the Engin
in the word inside thickness of work
in Einstein brick of eng. height with
only a width of 9 feet at top

Had also inclined it, should
keep the handle from should have a
small amount of circle of the same
radius to [illegible] beveled work
but it would have only difficult to
know the limits of the depth, as
any further will can charge [illegible] god
from the same time The same
depth for each would I imagine
[illegible] the handle time

[illegible] Rain as was being expected
broadcast over a long length of
S.L.R. main line and for this
purpose the S.L.R. wants a lift
to run its own express to and from
the depots.

Messrs Fowler & Co's prospectus
may be very misleading but they are not
always right. The rails they
suggest 24 lbs B.R. gauge with a
bearing of 2 ft 9 inches between the
chairs are not sufficiently
heavy for fast long
passenger a few miles of rails 4 lbs
B.R. gauge & Cats. up & lay down
at places where engines might
wanted in any spare or empty
wagons. & a train of [illegible]
in a few minutes with enough
wood or Newport it seems ridiculous
to get out steel chairs for the
line. Also the engines for present are
too light and would cause far more
wear than their own weight
was a gradient of 1 in 50.

about

had little Expectation of getting
out Ready made Weights from
England and the Experiments
must not be expected. We can
probably get the as much Coun-
tenance and Assistance — as 2 Engineers &
30 Seamen — from R. S. H. G. as
will be required for boat purposes
and if the time is the same Gentle-
man's. Can do all the repairs
needed without any difficulty.

After my Conversation with
Mr Macgregor I shall transmit the
any definite answer to this letter
must not be given. It will be best
towards them what sort of a Gun
we can get — & then decide the
form the Boats

Yrs very
[illegible]

Rec'd dispatch No 39
1st March 1855

Forests. North Kimara Forest Railway

(Vide docket working)

Unofficial reference from the Public Works Department Railways, No. 39 dated 1st March 1888 - transferring the above, together with a note by the Consulting Engineer for Railways

(Not to be published)

Submitted with reference to the Hon'ble Sir Richey's minute of 11th ultimo on Regr's No. 409A/1888 in 2/3 2.3.88

Await report of Survey GM 3/1

22188 - I 16/

No 7772 of 1888.

Revenue deptt

B. C., 21st November 1888.

Regd Nos
709 A
709 A

Re. transferred to the Public Works Dept Railway, with reference to the unofficial transfer from this Deptt No 7771 of to-day's date.

J. Dec Atkins
Offg Secy to Govt
20/11

WPM

12822 —

103

RAILWAY DEPARTMENT.

BOMBAY.

From Revenue Deputy

No. 7772 Dated 21.11.11

Received 22.11.11

Subject

Kanara Steel R. Project -

22/11

Former Papers

See also P.S. 12775 recent

C.E.

This is returned to this dept with reference to the last para of C.E's Note 23/2. I do not think the result of the survey will be likely to induce Govt to change their views on the unsuitability of this type of Rly -

22.

12822

103

RAILWAY DEPARTMENT.

BOMBAY.

From Revenue Deputy

No 7772 { Dated 21-11-22 / Received 22-11-22

Subject

Kanara Forest & Revenue.

Former Papers

E.D. 22/11

Please also B/1277 - Kanara

as 1324

C.E.

This is returned to this dept with reference to the last para of Collector's letter dated 8/12. I do not think the result of the survey will be likely to induce you to change your views on the unsuitability of this type of Rly

D.S.

Rec'd 6-3-89

74

We will each ship
[illegible] a little very wicked if
a line in the [illegible] would
[illegible] much use as the main branch
[illegible] ship. It would
[illegible] perhaps very well to show
[illegible] the main branch but
writing now

Yr 3/3

Rw Dept. no [illegible] 28 d/4-3-89

Earl

No 5498 of 1887-88

From

J. L. MacGregor Esquire
Conservator of Forests S.C.

To The Chief Secretary to Government
Revenue Department
Bombay

Camp Dandeli, Kanara
Districts, 22nd March
1888.

RECD MAR 26 '88

Sir, I have the honor to report that I have lately inspected the forests in the vicinity of the proposed line of railway from Nagargali to Gund, and to submit the following remarks on the subject with accompaniments.

2. Both Mr Gerrard, the Engineer in charge of the Survey-party, and myself consider that the line, for the present at all events, should not be carried beyond Potali, a village 22 miles from Nagargali Junction, and about

12 from Gund.

3. Mr. Gerrard has now carried his preliminary survey close up to Pātōli but the staking-out of the line has not yet been commenced. He informs me that for 2 or 3 miles from Nagargali (or rather Rāgi-kunri, which is the exact spot at which the line is to be connected with the Southern Maratha Railway) the gradient is extremely steep (1 in 37) and that it averages for the first seven miles 1 in 70.

4. After careful consideration, on the spot, of all the circumstances involved, I am of opinion that the line should be run from either the Alnāwar, or the Kumbārgaon, station of the S. M. Railway, via Hallial, to Mānōl on the Kālinadi, 4 miles South-East of Dāndēli the village at which

which Mr Gerrard's line now crosses the river. From Mānōt it would be taken through the jungles of Kānsirda, Kulgi; Khanewla and Mandoli to Potāli

5 The present project leaves the least wooded jungle many miles to the left. It goes straight from Dāndeli to Potāli

6. If Government do not approve of the Hallial-route, I still think it would be worthwhile to run the line from Dāndēli, via Kānsirdā, through the jungles of Kulgi, Mandoli & to Pōtāli. This would cause a détour of 3 or 4 miles, but it must be remembered that the cost of cartage is 14 annas a ton per mile, while railway transport would not amount to more than ½ an anna per ton. The adoption of the longer route would, I

estimate, make a difference of 1 mile at least in the average cartage distance to the line.

My reason for wishing to adopt the Hallial route is mainly that it would attract a large quantity of other traffic between Hallial and the main-line. Hallial is a centre of distribution for the whole of the surrounding country and has a population of 6000 souls. I have little doubt that if the Forest Department could permanently maintain the out-put of wood proposed by Colonel Peyton, that the line from Kumbargani or Alnawar to Hallial would pay well. I have asked some Sawkars of Hallial to give me an estimate of the value of the trade of the town and it amounts to 5,00,000 rupees in

the round numbers I should not been able to obtain an estimate of the tonnage carried, but the goods consist mainly of grain and wood, as may be seen from the accompanying estimate. I am inclined to think the estimate moderate, because I can see that the item for wood does not even the value of the wood annually sold at the Kallial depot. Colonel Peyton's proposed outturn comes to double this estimate (40,000 tons).

8. Aluawar is 7 miles from Kallial; Kumbanganí about 9. The Aluawar route runs through a rice-growing country, whilst the Kumbanganí line would run chiefly through jungle and dry-crop lands, so I am informed. A line by the latter route would, therefore perhaps be the cheapest. As

should, I think, be made
on the Metre gauge, in order
that there should be no break
between the sale depôt and
places of Consumption. Hallial
would be the depôt at which
all wood cut East of it
would be deposited. It has
the advantage of being a
large town out in the open
country, with good accommodation
for people attending the sales.
Nāgargāli is a small, poor
village, at which supplies
can be got only with difficulty
and there is no shelter for visitors.

I assuming that the
Southern Maharatta Company
would undertake the Construction
of the line from Kumbargani
or Aluawar, to Hallial there
would remain about 22 miles
of State line between Hallial
and Pōtōli; running through
much more valuable forests

than those traversed by the 44
Nagargali - Pōtōli line of the
same length. I think, too, that
the gradients on the Hallial
Pōtōli line would be far
more favorable than those of the
Nagargali line, which would
require 2 locomotives for each
train for the ascent from the
Kālnal-nālā to Rājkumar
and have very stiff gradients
throughout.

10 Should the S. M. Company
refuse to undertake the con-
struction of the line East of
Hallial, I think it would
be advisable for Government
to make it if the Western section
is to be made. It ought not
to be an expensive line via
Kumbārgani, and might, if
necessary, be made on a small
gauge.

11 As regards the gauge
of the Hallial-Pōtōli section,
I would recommend that it

should use the smallest, consistent with the work to be performed a 24-inch one will amply suffice.

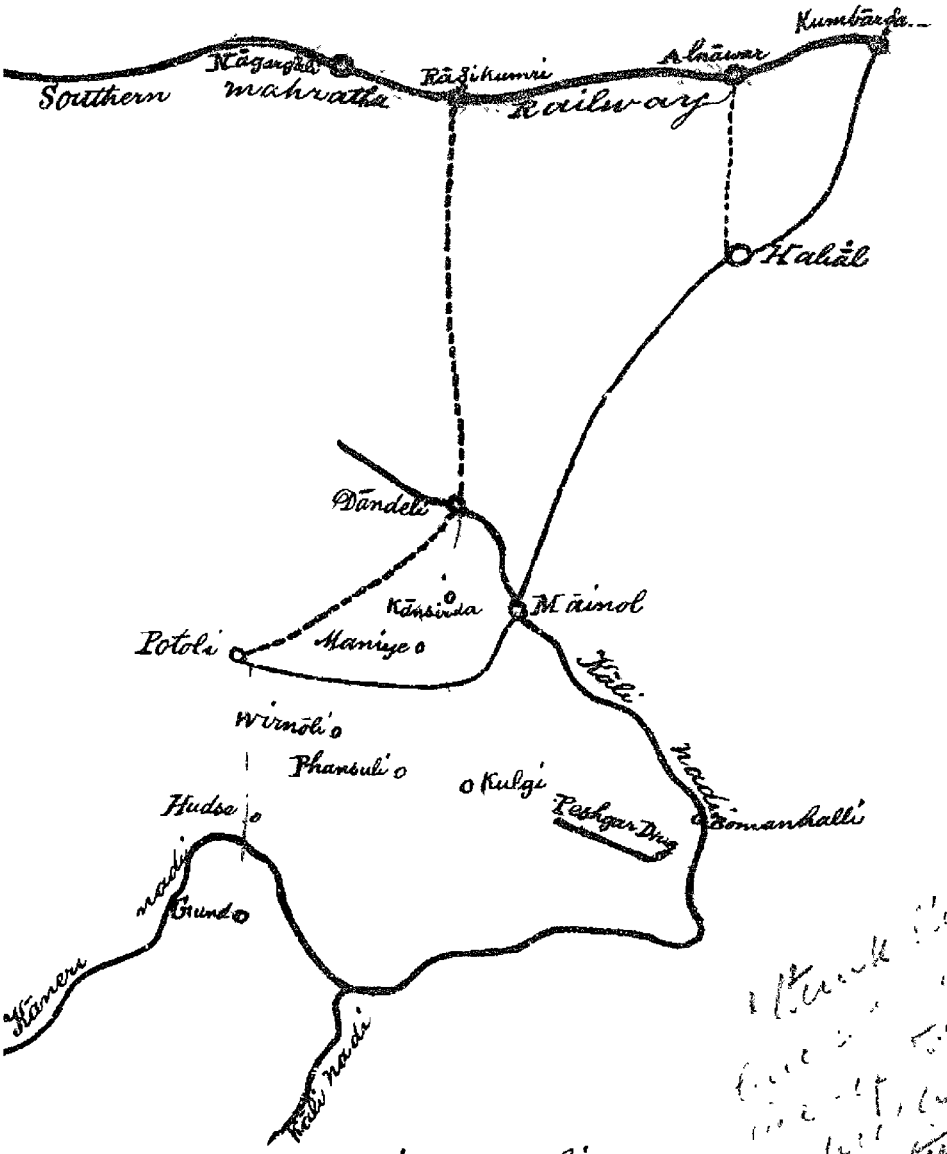
12. If a railroad be made the terminus of it, the sawmills might be moved there, where there is a large town and a perennial supply of water.

13. Should Government approve of either of these proposals, I would suggest that intimation should be given to Mr Gerrard, by telegram, to abandon the present line and take up the one which Government consider the best.

I have the honor to be
Sir,
Your most obedient Servant

J. S. Dennis
Conservator of Forests
&c

Sketch of proposed line



Proposed railway — continuous red line
Do do alternative — dotted do
Line under Survey — Do black line

Haliāl to Alnāwar	—	7 miles
Do to Kumbārgani	—	about 9 miles
Do to Māinōl	—	about 12 miles
Māinol to Potoli	—	about 10 miles
Rāgikumri to Dāndeli	—	about 13 miles
Dāndeli to Potoli	—	about 9 miles
Māinol to Dāndeli	—	4 miles

ample margin being allowed for curves: the direct line is much shorter.

accompaniment to No. 5298 of the Conservator of Forests, &c.
24-3-97

Estimate of

Exports from Haliyal

Population 6000.

Bamboos	30,000
Timber firewood &c.	210,000
Rice & other grains	118,000
Jagree	1,000
Betelnuts, Pepper, Cardamoms, Cocoanuts &c	4,000
Salt	12,000
Hides	2000
	377,000

Imports

Country spirit from Dharwar	60,000
Grains of all sorts Wheat, Maize, Bayree, Coolty, Gram, Dol, Jowaree, Linseed, Moog &c.	30,000
Cocoanuts from Goa via S. M. Railway	12,000
Cloth	15,000
Oils & oil cakes	10,000
Ghee, vegetables &c.	4000
Iron & other metals	10,000
	141,000

Accompaniment to No 5498 of the Conservator of Forests S.C.
24-3-88

4778

Construction of Steamer Point Railway.

Letter from the Conservator of Forests, No. 45 dated 4th March 1884 reporting that he has lately inspected the forests in the vicinity of the proposed line of railway from Steamer Point to Sandy Bay and submitting certain proposals in respect of it for the consideration of Government.

Submitted

The letter may be transferred to the Railway Deptt for consideration in the first instance

29/3 29.3.84

The present question needs not be opened.

There are certainly some immediate advantages to be looked for in making the wood depot at Hallyal which is already a trade entrepot with conveniences which would have to be some extent created at Steamer Point. Mr Macgregor is not [illegible]

be carried in his recommendation as to forest reserves. His para 5 seems to refer only to the southern portion of the line surveyed by Mr Gerard & indeed the main objection to the proposal to make the forest line via Hullyal is clearly that it would put some 12 or 15 miles of carriage upon all wood taken to the Railway. It is safe to assume that there is no unwooded forest within 6 miles of Hullyal I presume so that to compare the two lines as working projects the forest service of the line from Raja Mundry to Dandeli has to be set against the commercial service of the other line for 13 miles. Provincial Revenues are interested in the former. It is not clear that they would be interested in the latter. I think that unless there be better case made out Mr Macgregor's marks we should not recommend commercial lines with forest

P.T.O.

At the same time it may not be worth while to have that Hully gal line from Alma was examined & if it is a very easy & cheap line. Steps to push on the survey of the line to Marmora sufficiently to ascertain whether Mr MacGregors project is likely to be financially better than the original proposal. If that & much cultivated land be taken up this seems very doubtful.

Mr MacGregor concurs with Col. Peyton in thinking that the line should not at present be carried beyond Dotelle.
He would however advocate a deflection eastward between Chandelle & Dotelle this should think be examined by Mr Gerrard. if the best forests are to the east of the shortest route it will no doubt be better to make this deflection & shorten roads.
It is not possible without a proper map to compare Mr MacGregors recommendation as clear as could

tions with Col. Reynolds but I cannot suppose that it would be so sound a measure to take the line at once from Dandelli in a great coop. south to Potelli as it will be to go fairly direct to Potelli & thence lay branches, as advocated by Col. R, south & east.

The trail of a railway in good hands might I should think be profitably made to criticism the country, as the Americans say: wherever a tolerable gradient could be found our line must be a mere measure experimental & if we can get it for some years to come by a short line it will be easy to make extensions hereafter.

As the general result of considering Mr MacGregor's letter I would instruct Mr

41

Gerrard to examine a line both eastward of that which he has surveyed between Mia Kata and Koi Kapiri & Potelli & if he can find one which will bring him into the better forest mentioned by Mr MacGregor to adopt it. The deflection should not add more than 2 or 3 miles if the country is similar. Then the Railway Department might be asked to help in a rough estimate of a line from Almanar to Hellyar with examination of the commercial prospects of such a line independent of forest produce.

JM 2/4.88

We the Govt the Collector the Govt and the Ry Dep should give their opinion in this Letter with rough calculations as to additional

and cattle Revenue and Population in towns & villages on Timber. Inspector Forest Rivers & other hill and plains Districts Imperial and Provincial Roads & Communications of Revenue & Income Boundary or Municipal Acts, or taluka Officers and Native Officers Deputy Collectors, Surveyors, Surveyors, Survey

I agree with Hr Hon Govt
that the opinions of the
Coll^r & Forest^r may well
be invited as to the pros-
-pects of a line from Bellya
for trade purposes - But
they can only estimate, or
rather check Mr Macgregors
estimates, of traffic. The
cost of the line will have to
be estimated by the Railway
Depart^t.
Outside Bellyal & its im-
mediate neighbourhood
there is no service to be
looked for from the Railway
except forest produce
carriage. Cultivation except
in little patches round
the farmsteads that are
called "villages" in Kanara
does not exist.
I would ask a reference to
pages 23 & 24 of the Kanara
Gazetteer on the Bellyal &
Soopa forests. It will be

seen that the Kegdol
Ramapur group which
adjoins Hullyal & con-
tains some little population
have also been worked for
25 years - The group near
Ramnoor contains only 669
people in 4½ so called 14
villages - The line from
Rayanpalli goes through
the Sonpa forests which
are of the same description.
It will be seen from the
description on page 36
that the groups about
Kudsé & Potelli have
about 12 people to the
square mile.
I think therefore that
there can be no information
to be got as to any resources
outside of forest produce
which could affect the
location of the Railway, ex
cept between Hullyal
& the main line by the

MacGregor's figures are correct, Kullyal has a local trade, representing principally the surplus produce of the villages immediately contiguous to it on the east & north, of about 1,40,000 Rs inward & outward - beside forest produce. Salt should no doubt have been shewn in both import & export trade, but perhaps it is wrongly put under exports as I suppose it is merely brought to Kullyal for distribution in the neighbourhood of the Railway be located by Kullyal per trade journey I think the portion between Kullyal & the main line must be excluded from the forest Railway as our forest produce would be disposed of at Kullyal. That is Mr. MacGregor's scheme as I understand it & this is

seen that the Kegdol
Ramapur groups which
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tains some little population
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Unless we should not think be able to get the 1/2 & 1/2 terms for the construction of this portion which we can get for the forest railway proper, without some clear understanding with the G of I & the Railway Company as to the working of this portion for goods, passengers &c &c I think the Govt should get the report of the Collr & forward it with his own remarks regarding McGregor's proposal especially with reference to the Trade to be expected from Hullyal. The papers should be transferred to the Railway Department for their opinion & McGregor's rough estimate of cost of line from Dharwar to Hullyal.

HE 4th c. DR 3/4 R 12.4

his apparently will
have to be treated as
an official memorandum
with the Secretary's orders.
It can then Principal
not get them Registered

Mly
D.C.P

Send with papers
Shubabad Imm
M.D.18/1

[illegible] 13.000

[illegible] 780

Jade 72 kor 26.000 Pesos

[illegible]

17 Jour Mercredi 29/2

[illegible]

hier jeune 5498 March 78

Stante Almanach Marigal Louis Adam

Frau Lantage 14a Ton mile

[illegible] - 1/2 - Uhr 77 Neue Zeit

[illegible]

[illegible]

[illegible]

USSR ... 1897/98

... Jour ... 14 ... 1000

... 97 ... @ ... 13,000

... Day ... not more 180

Track 72 feet 26,000 Feet

... Balance of a Depot

... Rose Lancers 29/2

Talent

... pers 5098 March 98

Staff Almanac Marginal Limit Values

From Carriage 14 ton mile

... 8 - 1/2 - that 77 more Day

Kalyaf 6000 Pds W. Water ... Jan to

... 5 Lakhs ...

Skeleton ... Balances.

... !!

... Cash ...

... Bags ...

by Rail ... Troops ...

... Rations ... Camels ...

Lahore ... Resources

L Rear ... Inf Riches ... Rear ...

Point Pays ½ Reg 1. ½ Lt

... Jowar Part

Mein Opfer soll euch
Lust u. Leben
Wie Opferl in Gerechtigkeit
Ich will [illegible] der Ewigkeit

OUT.

ALWAYS

Hair, Tooth, Ha
Sponge, Soap,
Scissors Nail
(Silver Gold) - 2
Pen Shoe horn
Umbrella Stick
Quinine, Cascar
Cigars, Cigarett

Bedding

Various. Mayo coat.

Boots, Hunting P

Shikar { Gun a
Gaiter
Oleam
Shika
Shika
Field

Mosquito Net
Tube

131

No. 2297 of 1888.

Revenue Dept.

B. C. 14th April 1888

Transferred to the Public Works Deptt., Railway, for the purpose indicated in the Honourable Mr. Richey's minute of the 6th instant concurred in by H. E. the Governor

Gantrum.

Ag: Ur. Secy to Govt.

14/4

Regr. No. 9774 (to be returned)

I am afraid the results of the last two years surveys are not hopeful. Mr Leonard does not appear to have a good eye for location, but even if he has kept near the level expenses have been very heavy. The line he has selected is marked in red pencil on the tracing of B/ No 3505 and is described by him as practically one continuous descent from the junction with S. & Q. to Dandeli & as continuous ascent from Dandeli to Potoli. There are cuttings varying from 20 to 40 feet [in rock possibly] and gradients as steep as 1 in 35 and 1 in 40 against the load. He has had repeated orders to accommodate the track more to the contours of the

† Apparently the line selected is 11 miles to Dandeli & 6 miles on to Potoli total 17 miles

fractures of the Coronoid and I hope has attended to them, but I fear the Contusion will be for a long time, may at first effected the health of the staff has been very indifferent & for one whole fortnight little or nothing was done owing to the majority being down with fever A large list of invalids & a Hospital Assistant has been sent to Mr Leonard some time ago

Mr Macgregor, proposed time in Hurlbut and Potulla in shew in blue on the same map I explain this to camp is fairly correct but Mr Leonard complains, the large map [illegible] is very inaccurate and often positively misleading

Mr Leonard is now attacking us on the Raja Kumar & Potulla & has recommended to withdraw Mr Kaye hopes time as soon as he can She is afraid he would have time before the rains set in

to run a direct line from [redacted]

of Mr Macgregor's route

If the Railway to [redacted]

finish very little can be selected between

Alawara & Kambaganara & Hallet

and of the State was based of

permanent as well then I dare say

the Govt would contribute evidence to

build a permanent bank to Hallet

But the line from Hallet to Marind

seems very stiff country There is

evidently a steep rise to the crossing

just east-west of Hallet, but I

hope Mr Eenard will be able to

make a reconnaissance along this

line if we cannot do more before

the rains

The second platform seems very

difficult of access as in fact

[redacted] point is very rough Mr.

Eenard has now walked east-

to Mundoro and says a cheap

line is impracticable.

Sunday a line east-towards

P.T.O.

Kiulga would be apparently difficult to negotiate.

On the whole therefore I believe the region will be far more difficult to make than I was led to expect as I understood that the country was much the same as that in the neighbourhood of Almora & Ranikhet The Estimates have yet been framed but in any likely work such will be more or less as well as

I observe for the proposed Calcutta railway transport at ½ anna per mile against the present railway rate of 1¼ annas The actual rate will of course depend on the cost of the line and the expense of working but assuming that the work of the Calcutta line can afford to carry wood under ½ anna per mile, as I should not expect to get an haulage & interest to work out much under 3 annas a ton — and even with this rate will be the large saving of 11 annas per

1917

Lon. The Hon. Sec. Rec. Depts
should like to see the H. file again
with H- here marked in ink
that a Dr Macgregor sketch
The Rec. Dept. still sticks to
the old form of Officers reference
& in consequence I got H- file only
this morning - had it been referred
unofficially under the recent order
I would have got it a week ago.

F 20/4

Rec Dept no 05

Hon. Mr. Rickey.

(The C.S commr. on the special
advantages often unofficial reference
system in a case often binds it
ordinary formal reference seems
far preferable, and moreover what
the Hon. Mr. Rickey directed was
a transfer to the M. Dept which
implies an ordinary official reference
Major Fischbeck therefore considers
the C.S.C. system the best but in
Bombay we act on very much for
many years under the unofficial
system.)

Recd 20-4-88
Read 31-6-88.

187.

The Railway Depts are at
encouraging. The country is
evidently very difficult.
Before going further into
merits of competing projects
I think we may as well
wait for the result of Mr
Gerrard's reconnaissance of
the Bulkley Line, & transfer
office to the Railway Depts,
who will furnish the
information we want as
soon as it comes to hand.

JM 2875
31/5

No. 3548 of 1888.
Rec. Dept.
&
R. & 31 May 188

Retransferred accordingly
to the P. W. Department,
Railways. E. Lawrence

Ag. Ms Secy. to Govt
31/

x 1697A
(to be returned
please)

6172 141

RAILWAY DEPARTMENT.

BOMBAY.

From The Revenue Deptt.

No. 3548 { Dated 31. 5. 88. / Received 1. 6. 88

Prospect of the proposed Kanara Forest Railway

Former Papers B.J. 5330, 4444, 5364
Pra 44-46-3/88, 307-3/88

6/8
2/6

Do on lines specified
to be required on this

1st Oct 6/6
2/6

1st 6/6

Asstt

6172 141

RAILWAY DEPARTMENT.

BOMBAY.

From The Revenue Deptt.

No. 3548 { Dated 31. 5. 88 / Received 1. 6. 88

Subject
Prospect of the proposed Kanara Forest Railway

Former Papers B. J. 8330, 4444, 5304
Pro 44-45-3/88, 307-3/88

62
2/6

Do and inform
to
Engineer on this.

Sec Ry dept
Bd.
2/6.

1/6/6

Submit

Revenue Department
Year 1890
Volume - 91

...submitted for orders.

...Auditor Gen...
...annual Report...
...returned...
...

Respectfully for orders.
Mr Auditor General's Annual Report for the year ended 31st December last has been received in this Office & is now submitted thereto.
C.J. Wallace
Mr
2/11

The Report has been sent to Messrs. Hart Richey
Esq. Mr Gen. Returns H.F. 7/11

No 3188 of 1888

Revenue Department.

From

W. H. Propert Esquire
Commissioner, Southern
Division

To,

John Nugent Esquire
Chief Secretary to Government

Poona 16th October 1888

Sir,

In returning the papers received with the Under Secretary Mr Atkin's memo. No 2306 of 16th April last I have the honor to submit a report from the Collector of Kanara

x No 1237 of 22nd May 1888

on the proposal made by the Conservator of Forests, from which it will be seen that the present trade of Halyal is about 5,00,000 and that some increase in it may be expected if Haliyal is

Recommitted for orders.

WO
23/7 Brig. Gen. Carr's
Final Report of his
Service in
Cuba
23/7.

AGO 24/7

Re-rec'd Oct 1 on Transfer
Year 1890
Volume 91

Recommitted for orders.
It is understood that
the final report of Brig. Gen.
has been received in this
Camp Office & is under
consideration there.
GAS
2/11 C. Wrenshall
Maj
2/11

Respectfully sent to
Sent to The Hon. the Secy
for consideration
H.C.P. 7/11

No 3188 of 1888

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[x] No 1237 of 22nd May 1888

connected by Railway. But if the Railway were taken to it either from Alnavar or Kumbargavi, the expense on account of compensation for land would be very considerable, especially, if the former line were determined upon.

2 On receipt of the Collector's report I forwarded all the papers to Colonel Peyton, late Conservator of Forests. Sanction more, who has intimate acquaintance with the Kanara District and the productive capabilities of its jungles entitle his opinions to great weight. I forward a copy of the notes, with which he has favoured me.

3 It will be observed that Colonel Peyton is entirely opposed to the lines suggested by Mr. Macgregor, and I consider he has shown

shows very good grounds
for undertaking the line from
Sagargalli or rather Râji Kumri
to Potoli via Dandeli in pre-
-ference to those proposed by Mr.
Macgregor. The outlet which this
line will provide for the valu-
-able forest produce of the Kanara
jungles will surely prove more
advantageous than the possible
~~imp~~ the trade of Haliyal

4 I regret my inability
to give an authoritative opinion
of my own based upon personal
knowledge and experience, but
I have as yet had few opportunities
of visiting the more retired and
distant portions of the Kanara
jungles

I have the honor to be,
Sir
Your most obedient Servant

Commissioner S.C.

Recd 17.10.88

12775

21/11/88

3113

No. 1237 of 1888

From,

The Collector of
Kanara;

To,

The Commissioner,
Southern Division.

Camp Sirsi 22nd May/88.

Sir,

I am directed in your
No. 1109, dated 19th April/88, to have
the honor to report, as follows:—

2. I enclose a statement
showing the approximate yearly
imports, and exports into and
from Karwar. The imports
amount to Rs 147,400: and the
exports to Rs 356,228: making
a total of Rs 503,628. This is
rather

rather less than Mr Mac Gregor's estimate, which amounts to Rs 518000.

3 Karjat is the only large town in the North and North-East of Kanara, and is the trade centre for the whole of that part of this District. The principal trade is in timber and bamboos, and with a metre gauge railway joining the South Mahratta line, the trade would, no doubt greatly increase.

4. At present the principal trade consists in forest produce, the agricultural produce of the surrounding country is

not

not much more than is sufficient for local consumption and am of opinion, that it is the timber trade, that Government must look to, for making the line pay.

5 Still there would, no doubt be some considerable increase of general traffic both on the Rajamundry and Dandeli there would be none, at all.

6. With regard to the three alternative lines, the route from Rajahmundry to Dandeli, passes almost entirely through Government Forest, and waste land, so that

that the expenses on that
line would be confined to
Engineering expenses.

7. Of the two lines to Habijal the road from Habijal to Aliaavar, is comparatively flat, and I presume presents no Engineering difficulties, but it runs entirely through rice land and the expense for compensation would be very great

8. I do not know the exact line which would be taken for the railway from Kumbar-gauvi to Habijal. The path to Kumbargauvi leaves the Habijal-Aliaavar road, about two miles from Habijal

and

and passes through twenty
one cultivated survey numbers
of the villages of Kanvad
and Magwad, then for three
miles the road goes through
jungles then through four
cultivated fields near Dhopan-
hatti, then through a mile
and a half of forest and
two miles of open country, and
then a few more cultivated
fields Deducting 2 miles
along the Provincial road
the path passes through
cultivated lands for 3 miles
through the jungle for 4 miles
and for 2 miles through an
uncultivated

uncultivated open country.
From the annexed map it
will be seen, that although
the footpath actually passes
through cultivated numbers,
all these numbers adjoin
or are near to jungle Nos
of the Magwad village, so
that the [redacted] rail would
be conveniently taken al-
most all the way up to
the limits of this district
through the jungle. All the
survey Nos of the Kerwad
village enumerated above,
are dry crop lands, as are
also those of Magwad with
the exception of No 62 and part
of

of No. 57, which, are rice lands.
All the Survey Nos. of Dhopan
hatti and Kairatti are
dry crop lands.

9. The road from Kalyal
to Alnavar passes through
a succession of rice lands
so that if the railway is
to be brought to Kalyal at
all, the Kumbargauri route
would be, no doubt, the
cheapest; as far as the pay-
ing of compensation to
owners of lands, is concerned

10. It would, however, be
absolutely necessary that the
line from Kalyal to —
Kumbargauri

1277 5

Kumbargaon should be
on the same gauge as that
of the Southern Maratha
Line, or such a short line,
will never be used for general
goods traffic.

I have the honor to be
Sir,
Your most obdt Servant

A Maitland
Collector of
Kanara.

Statement Shewing articles imported into Karwar during one year

Imports.

No	Name of articles	Number of carts.	Value in money of goods loaded on a cart.	Total	Remarks.
1	Salt	240	50	12000	
2	Cocoanut	200	30	6000	
3	Dry cocoanut	20	120	2400	
4	Betelnut	40	125	5000	
5	Fish	100	25	2500	
6	Kaju seed	5	120	600	
7	Coir	20	50	1000	
8	Jaggory	400	50	20000	
9	Cocoanut oil	30	130	3900	
10	oil	150	100	1500	
11	Kaju oil	10	30	300	
12	Tobacco	50	50	2500	
13	Kerosin oil	50	70	3500	
14	Sugar	50	80	4000	
15	Drugs Gums and Spices	50	100	5000	

16	Iron	40	50	2000
17	Vessels	10	400	4000
18	Chillies	100	75	~~7500~~
19	Vegetable	200	25	5000
20	Wheat	100	40	4000
21	Jowari	200	25	5000
22	Grain	50	40	2000
23	Horse Gram	200	20	4000
24	Pijo lea	100	30	3000
25	Staff lowers	50	30	1500
26	Linseed	10	40	400
27	Oil seed			
28	Hindi	100	15	1500
29	Tamarind	50	30	1500
30	Green & black grain	40	25	1000
31	Cloth	200	500	10000
32	Betelleaves	100	25	2500
33	Ghee	8	250	2000
34	other Sorts of grain	40	20	800
	Total import			147400

Kanara Collector's office
Camp Sirsi May 1888.

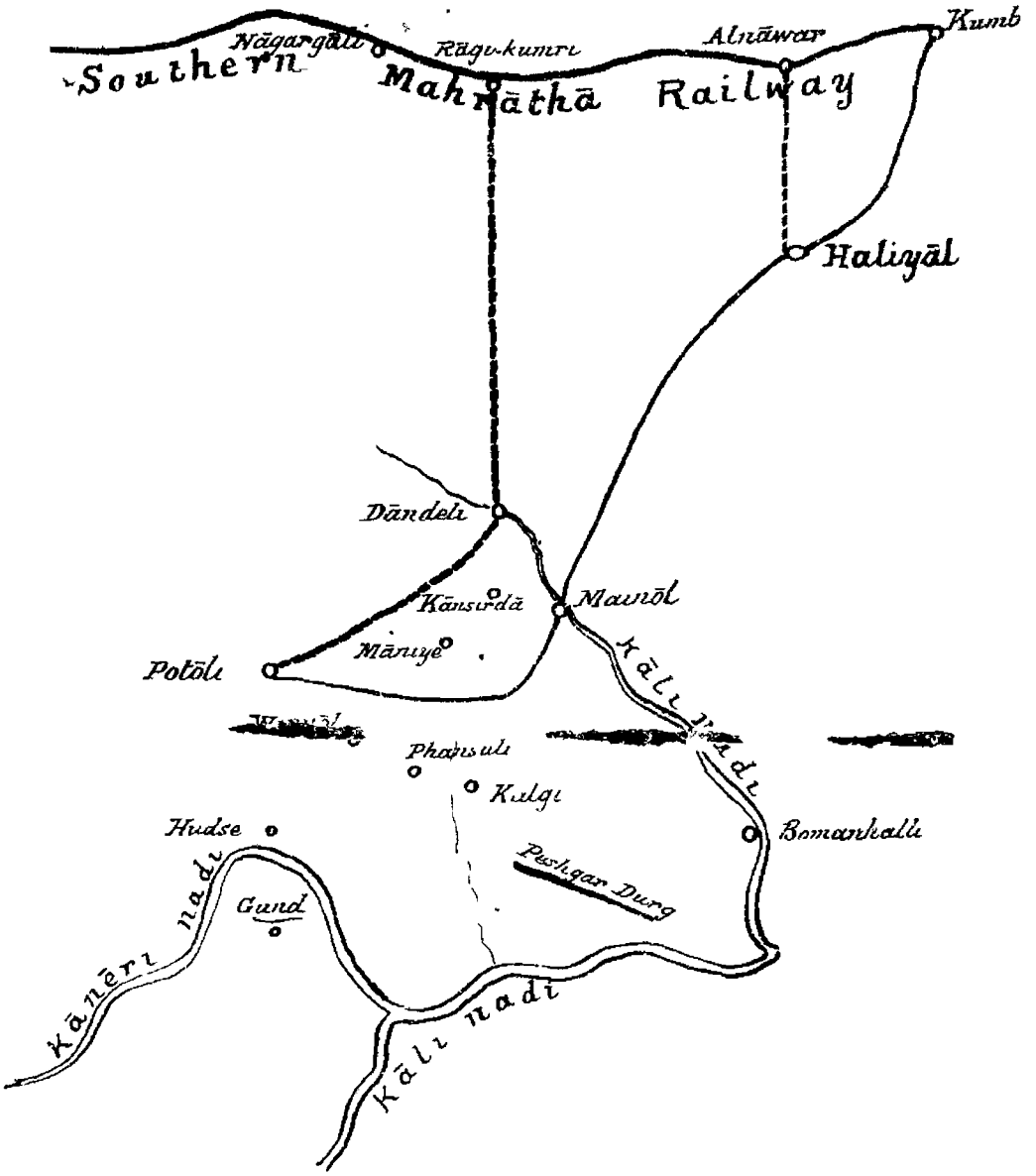
Collector of
Kanara

Statement shewing articles exported from Karaikal during one year

No.	Names of articles	No. of carts.	Value in money of goods loaded on each cart	Total	Remarks
	Agricultural & other produce.				
1.	Paddy	2501.	25.	62500.	
2.	Rice	1200.	40.	48000.	
3	Chirmeuri	200.	25.	5000.	
4.	Cocoanut	75.	30.	2250.	
5.	Plantains	50.	12.	600.	
6.	Mats	5.	10.	50.	
				118400.	
	Forest produce.				
7	Timber	Chundies 7700	Rs 8 for candy	17,5000.	
8.	Rafters	No. 7400.	Re 1 each	7400.	
9.	Sleepers.	9000.	2-8 --	22500.	
10.	Sleeper shares	2200.	-	250.	
11	Bamboos 1st sort	24,800.	Rs 3 for 100.	744.	
12	Ditto 2d sort	49000.	Rs 2 do.	9800.	
13	Ditto 3rd sort	221400.	Re 1 do.	22134.	
				237828.	
	Total export		Rs.	356228.	

Muthuvel.
Collector of
Karaikal.

— Sketch of Proposed Line



Proposed Railway - - - - - - - - - - - - Continuous red line
— Dº — Dº — alternative ——— Dotted — Dº —
Line Under Survey ——————— — Dº — black line

Haliyāl to Alnāwar ——————— 7 Miles
Dº to Kumbārganvi —— about 9 miles

— Dº — to Manōl ——————— about 12 Miles
Manōl to Pōtōli ——————— about 10 — „ —
Rāgi-kumri to Dāndeli ——— about 13 — „ —
Dāndeli — to Pōtōli ——— about 9 — „ —
Manōl to Dāndeli ——————— 4 Miles —

Ample margin being allowed f curves the direct line is much shorter

J. Edwards
Conservator of Forests, S. C.

Sketch of Proposed Line

Note on the proposed forest Railway to connect the forests with the Southern Maratha Railway at either Nagargali, Alnavar or Koubargauri.

The original idea was to construct a rail or tram-way exclusively for forest purposes; and the scheme assumes quite a new phase if the project is considered with the object of attracting other traffic.

The suggested line between the Southern Maratha Railway Station at Nagargali and Goond would take its course from starting point to finish through fine forest abounding in large timber of many valuable kinds and in an inexhaustible supply of firewood and bamboos for which there is an extraordinary and ever increasing demand literally

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Railway to connect the forests
with the Southern Maratha Rail-
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for which there is an extraordinary
and ever increasing demand.

Literally

Literally speaking, every furlong throughout the length of this route would furnish its quota in either large, medium, or small timber, or of bamboos and fuel. This is worth recollecting.

The reasons apparently advanced by the Conservator of Forests against the route are that the gradients are too steep, and that the least worked portion of the forest (the Peshkar Droog) is left many miles on one side. The answer to this it may be stated (1) that the gradients since Mr Macgregor's writing have been greatly reduced, and the 1 in 37 reduced to a few chains by Mr Gerrard, and (2) that the excellence of the many forests lying immediately on both sides has been greatly overlooked, while on the other hand, a little consideration might

might have shown that the additional cost required to bring the timber of the Peshtar Drought meet the line where it crosses the Kalinadi river would be comparatively small.

The alternative line from Ahanvar and that proposed by Mr Lucky region from Kombargauvi would pass the former through mostly rice lands for about 7 miles to Haliyal, and the latter through rather a rough country alternating between low thin forest cultivation and waste lands for 10 miles to Haliyal. From here the next 4 miles of this line would also be through an open rice growing country to near Kosoroli and from thence to Kainol (8 miles) there is really little large timber. The forests also most of the way are thin

from being much inhabited by Gowlies. In fact the forests by this route are not good till the Kalinadi river is crossed, and the crossing would more likely be at Karyampoli nearer Dandeli than Haliyal. The best Bamboo forests are left away out of reach along the Sambrani Bhagwati road.

After crossing the Kalinadi at Karyampoli, the size and quantity of the timber greatly improves, but it is not understood at all how the line is to be taken on through the Kolgi Pansoli and Yeriyali forests to Potoli.

There is a large ridge of mountain rising near Dandeli that runs from there North and South to the Kalinadi river, and how this is to be crossed by

Macleod

Macgregor best knows. Besides, after crossing this ridge the ground is very rough beyond till near the forest road between Dandili Purdani and Potoli. Mr Macgregor's sketch explains nothing, neither do his notes, but a line drawn from Dandili to Kausirda Kulgi and a point near the joining of the Kaveri and Kalvadi River of his sketch, would explain situation, though not the difficulties of the ground which are many and great.

The Sketch is not very illustrative of the situation and its importance, but it may be said that to get his line to Potoli and the big forests about there it would have to countermarch from the curve along the eastern side of the ridge and out round between

Kamanda and Kandili where
it would strike the suggested
line at the Kalinadi crossing
between Nagargali and Potoli.

Instead of all this, however,
a small light tram to be worked
by bullock power might be laid
from the Peakha Drog to the
Kalinadi crossing of the Nagar-
gali Potoli line, so as to get the
timber there [redacted] bleak
by carts, and the average distance
would not be much over 7 miles

Taken for granted, however,
that Mr. Macgregor has found a way
to cross the Kandili Kamsirda-
Kolgi ridge and to overcome the
other obstacles, the distances
of the alternative and proposed
line of Mr. Macgregor from Alwaye
and Koombargauvi to Potoli would
be—

be 29 and 32 respectively, Compared with 22 of the Nagargali Potoli route.

The alternative and proposed line of Mr. MacGregor would cost much on account of the compensation for land that would have to be paid. There would also have two bridges built approaching and leaving Haliyal (and) lastly over the [redacted] fully there would not be a bamboo or stick of firewood to cut, and over 14 of the other, there would not be very much more

x [redacted] alternative

x the proposed line of Mr. MacGregor

as to the additional traffic that would be obtained via Haliyal, there would be about a lac of Rupees worth a year, for it must be recollected that much of the imports shown by the Collector enters from the

South and not by the rail or South-ern branch of the Southern Maratha Railway. Some more Cocoanuts betelnut and Jagri might probably come or be sent from the Yellapur direction, were there a line open as far as Haliyal, but such goods would not swell greatly the receipts of the Railway.

Besides I dont believe that with a rail to Haliyal a line would get even as much as one half of the timber and bamboos leaving there. Much would go as usual by carts to Dharwar and Hubli and only that to Belgaum and other distant parts by rail. Such would not be the case with a line joining at Nagargali from where the Railway would

would be found to be the
main distributing agent to-
wards Bellary, Sholapoor and
Poona, also Goa.

It should be recollected
that it was never proposed to
abolish Haliyal as a forest depot
but only to make a new and
larger one for the wider distribu-
tion of forest produce to more
distant parts than at present.

It may be added to these
notes that a survey of the forest
of Khanapur has shown that
only 30,000 tons of firewood are
available annually from them,
whereas the yearly requirements
of the railway alone are 48,000
What are the people to do and
where are they to look to for
fuel in the face of such a
demand.

South and not by the rail or Southern branch of the Southern Mahratta Railway. Some more Cocoanuts betelnut and Jagori might probably come or be sent from the Yellapur direction, were there a line open as far as Haliyal, but such goods would not swell greatly the receipts of the Railway.

Besides I dont believe that with a rail to Haliyal a line would get even as much as one half of the timber and bamboos leaving there. Much would go as usual by carts to Dharwar and Hubli and only that to Belgaum and other distant parts by rail. Such would not be the case with a line joining at Nagargali from where the Railway would

would be found to be the
main distributing agent to-
wards Bellary, Sholapoor and
Poona, also Goa.

It should be recollected
that it was never proposed to
abolish Haliyal as a forest depot
but only to make a new and
larger one for the wider distri-
tion of forest produce to more
distant parts than at present.

It may be added to these
notes that a survey of the forest
of Khanapur has shown that
only 30000 tons of firewood are
available annually from them,
whereas the yearly requirements
of the railway alone are 48000
What are the people to do and
where are they to look to for
fuel in the face of such a
demand.

1277-5

demand. It may be met easily and more cheaply from Kanara by the Nagargali Potoli route, and the sooner this has attention, the better for the people and the finances of the Forest Department. Nagargali is the best centre of distribution for timber and especially for bael.

Dharwar
1st July 1888

Sd/ W. Peyton.

To,
W. H. Propert Esquire
Commissioner S. D.
with Compliments.

True copy

Commissioner S D

7 Lots 20.4.88 on Cof 75690

Difficult Kambanyan - Bombay
Kyal & Manual Berg Kanny Dewan
a ridge (??)

1st Landage
Coal 14 a Lea
Lemon canny ½ a Lea or such
Lea as the vicinity without much
rock 3 as Lea -
N.O References

Chief Coal Wash Lucury
28-5 88

PS Lots: 20-11-88 Lullu
Relents from Lime Clerk as in
above Neg! —

Mr Parker Kalyal Lada 5 Lakhs
Abraham - Kalyal Land dear
Coal Lullu Timber ! Land more —
dependent There would Be some Low
Lemon. The A H Line none a the RK
Lemon Lots dear. Kalyal Roads
Ask Abraham & Kambayam

Rain - drainage and Machine Race
Tin in the Rains Kalyal, the Low are
Ja with Rain ridge N 1 S between Mand
& Phanoli Ja ja with blow for 2°
Labour Seam 4 Late a year out of
Kalyal.

Mr. W - Cal 7 } Forest Off diffi
5/11/88 3/3/89. } Mine wan
Mine Location

1273

remand It may be met easily and more cheaply from Kaisara by the Nagargali Patoli route and the sooner this has attention, the better for the people and the finances of the Forest Department. Nagargali is the best centre of distribution for timber and especially for fuel.

Dharwar
1st July 1888

Sd/ W. Peyton.

To,
W. H. Propert Esquire
Commissioner S. D.
with Compliments.

True copy

Commissioner S. D.

7 Kuala 20.4.88 Cef 7.5498

a difficult Kampong - Dusun
Pahyat & Iranun Berg Kadazan Suncdan
a Pledge (??)

Cef 7 Landage
Centre 14 a La
yeoman convey ½ a to Brue a much
Line a/ca excludes Indian much
Lunch 3 acs Lan

N.O References

Kitchener Prat Wars Survey
28-5 88

CSI
12,795 p 11-11-88 Zulkifli

Zelanotion Lane Lemon and Lee -
about Veg! —

In Jan 1 Ja al dade s/alekh
Almanac Hakimi Land dear
all Lemon Lemon & Lime mixed —
delivered Thus worried Ha le sam Lee
not in the A H Lai name a the RK
Lime Frog de Lai Hakimi Rombo D
Dok Almanac a Kambayaran

Rice - Diadayaan Ino Lemon Rice in
in a Lemon Kalasodi, The Lime in
Pahyat in Pledge N 3 Pattimen Iranun
& Phanoh Pangajali Lime for a
Lesser Loans y/ate a year out of
Kalumpit

Jawat Off Dist
Inscription

Mr W - Cef 7 } more
5/1/88 3/3/89. } Lemon Lemon

INE

Cloth, Brushes.

Powder-
nd Hair
rs – Scarf Holder.
utton hook.

Pomds. Paper
Matches. Money. Cheque Book
Towels

-1, Lamps, Tennis Bat.

Cambridges

g or
Rifle
a q
es

No 776 of 1888

Revenue Department

Bombay Castle 9 March 1888

X
3113A

X
Transmitted to the Public Works Department (Railways) in continuation of the transfer from this Department

X
No 2697 dated 14 April 1888.

J. M. Mills
Under Secy to Govt

X It was not in the register, and was not among the papers in the Govt Gardener's Office.

Rec'd in Collector's Office 17/4/88

Rec'd Collector's & Dist. Judge's Book from Rev Department

9/4/88

12775 173

RAILWAY DEPARTMENT.

Bombay.

From Revenue Department

No 7716 Dated 19-11-88
Received 20-11-88

Subject

S. M. Ry
Proposed joint railway to connect the Kamans' Canals with the

Former Papers

Please see also B.S. 12822 and Rev. Dept. M.O. dtd. 7771 of 21-11-88. below.

22/11

29/11

Colonel Pearson submits, as
must appear to him, the
desire of the proposed
Railway Company. The
primary object of the

of the Railway in to Lerwick
the Parish of Sandsting Weesdale
Dunrossness Aithsting
Bressay Burra Isle
Unst Yell Fetlar
the Parish of Northmavine
32 miles and the cost
about £6,400,000; direct
from Reykjavik or
Hafnefjord, the distance
is 22 miles & the cost
about £3,700,000 - 3.
The Parish of Lerwick
Lerwick & Scalloway
Parishes of Walls & Sandness

177

3417A

No. 7770 of 1888.

R. D.

B C, 21st Nov. 1888

To

The Conr. of Forests

B. C.

Sir,

A report of the Kamara Forest Railway Survey subd. by Mr. A. Errard, late Engineer in charge of the work, is at present under the consideration of Govt. I am directed to request that you will

177
3 H 17 A.

No. 7770 of 1888.
R. D.

B. C., 21st Nov., 1888.

To
The Conservator of Forests
B. C.

Sir,

A report of the Kamara Forest Railway Survey Subd. by Mr. A. Gerrard, late Ex. Engineer in charge of the work, is at present under the consideration of Govt. I am directed to request that you will

will be good enough
to wish to Govt
a report as to the
advantage from the
forest point of view
of taking off the
line from Ragihunna
rather than from
Nagargalli & to
mit estimates of the
revenue that wd in
your opinion be realized
from the forests tapped
by the railway in
case it is constructed
I am to state that
in

in framing these
estimates you will take
as a basis for fixing
estimates shown in the
accompanying extract
from a memo: recorded
by him, & examine
those estimates care-
fully by the light
of all additional
information which you
may have collected.
I am at the same
time to forward
for your information
an

an extract from Mr
Gerrard's report
giving an estimate
of annual gain to
Govt based on Col:
Peyton's estimate.

I have &c,

J D C Mullins

~~to~~ ~~Govt~~ Y to
Govt

MMM 16/11

MBM

No. 4278. 1888/169.

From

The Conservator of Forests
Southern Circle

To

The Under Secretary to Government
Revenue Department
Bombay.

Camp Sawnur, Dharwar
District 19th December 1888.

Sir,

I have the honor to furnish the report asked for in your No. 7776 of the 21st November 1888.

I

2 From the forest point of view, I can see no advantage in making Rāṇi-Bennūr the junction of the proposed railway in place of Nagargali. On the contrary, as there is a station at Nagargali, it would, other things being equal, be a much better starting-point for the line.

II

3 In estimating the quantity of log wood available I take Colonel Peyton's

an extract from Lieut
Bernard's report
giving an estimate
of annual game to
Govt based on Col
Peyton's estimate.

I have &c,

for Allums
Lieut Govt

Govt

No. 4278 of 1888-89.

From

The Conservator of Forests
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II

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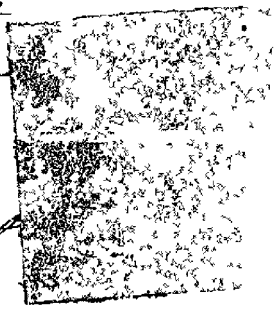
Peytons figures. I am not yet in possession of data which would enable me to confirm them, or substitute others, but I consider that, as regards the sustained yield of teak and the saleable quantity and price of junglewood, his estimate should be accepted with caution. In my opinion, the safest way to estimate the effective value of the railway would be to take the average yield of the last few years and compare the cost of extraction by means of carts with the cost of extraction by means of the railway. The only timber-species for which there is any great demand at present is teak, and even that article has come into competition with Burma-teak in the markets of the Southern Circle, so that increased sales of our wood would probably result in a reduction of the average price obtainable.



I think, too, that it is not desirable to increase the annual quantity of teak to be sold until we can feel pretty certain that more can be cut yearly than the quantity hitherto cut without trenching on the capital stock necessary to afford the increased out-turn.

4 It is necessary to bear in mind that it is not so much a question of bringing new tracts into working as of cheapening the transport of wood brought from areas which can be worked by means of carts.

5 Subject to the above proviso I estimate the annual receipts and expenditure, in by plotting the forests to be tapped by the railway as follows:-

Receipts

1500 Tons of log ~~teak~~ @ ~~Rs~~ 75 per ton — 112500
2000 Tons of Jungle wood @ Rs 40 — " — 80000
200 Tons of Blackwood @ ~~Rs~~ 48 — " — 9600
10000 Teak poles @ Rs 2 each ——— 20000
Nett value of fuel consumed by the Locomotives employed on the line @ Rs 1. 12. 0. a ton —

Expenditure

Expenditure

1500 tons of log teak @ Rs12 a ton — 18000
2000 " — Jungle wood @ Rs12 " — 24000
200 " — Black wood @ Rs12 " — 2400
10000 teak poles @ 8 annas a pole — 5000
Cost of transporting the above by rail to a depot on the Southern Maratha Railway — ?

Explanatory Note
in justification of the above estimate

Teak Logs

6. The following are the figures for the last three years.

	Tons sold	annual yield
1885/86	2623	71 2 6
1886/87	1604	97 13 4
1887/88	1763	78. 1. 0

7. 1885/86 was the year in which purchases by the Southern Maratha Railway Company reached their maximum I think Colonel Peyton's estimate of 64 trees a ton well on the safe side, considering that he proposes to reduce the quantity to be cut by 200 - 300 tons and that the wood will be sold on the line of the S.M. Railway which is 7 miles from the Kalleal depôt, where the prices better to be realized have been obtained.

One

One thing however, has to be considered the Railway Company last year got Burma teak from Bombay in preference to our Hallial wood at 48 rupees a ton. Still I consider Rs 75 a safe estimate provided no more log-timber be brought to Hallial, or elsewhere from the Hallial Divisional Forests.

Blackwood

8 80 tons have been sold yearly for the last 3 years at an average rate of 59 rupees a ton. There is scarcely any demand at Hallial for blackwood. Colonel Peyton estimates for 200 tons @ Rs 48 each. I let that stand.

Junglewood

9 Colonel Peyton estimates that 2000 tons of junglewood can be disposed of at Rs 48 per ton. Last year 651 tons were sold at Hallial and realized on an average £6. 12. 8.

10 For the 2 previous years the figures are

	Tons sold	Price per ton
1885-86.	256	£6. 14. 0
1886-87.	214	62. 15. 0

Nothing can be gathered from these figures, regarding the probable effect of increasing the quantity offered for sale to the extent proposed by Colonel Peyton, but I think he is over-sanguine, and that the estimate should be lowered to Rs 40 a ton considering that he proposes to treble the quantity sold last year at an average rate of 46. 12. 8.

Teak-poles

12 I allow the estimate to stand although I feel that it is not desirable to cut out more teak-poles than require to be removed for the good growth of other teak-trees, or on account of them being suppressed, or dead.

Bamboos

13 The following is a statement of bamboos sold during the last 2 years:-

Year.	@ Rs 30 per 1000	@ Rs 20 per 1000	@ Rs 10 per 1000
1886/87.	19275	373275	1610175
1887/88	24475	490325	2213425
Colonel Peyton's figures are.	200000	400000	500000

14 There is not much demand for big bamboos, but Colonel Peyton

estimates a tenfold increase which appears to be extremely improbable. Any how, I do not think we can expect the Railway to bring in much additional bamboo-revenue, because, although the transport of bamboo may be somewhat cheapened by it, the rates charged will remain the same, and because the area now worked for bamboos is probably capable of supplying the quantity required by the public. There is no restriction in regard to the number of any kind of bamboo that may be extracted. People go to the nākās and take out permits to cut for themselves as many stems as they require; and it is not likely that with a good supply close to the S. Pa. Railway the opening-up of supplies further a-field would materially increase the returns. For these reasons, I prefer to leave bamboos out of the calculation of advantages

~~advantages~~ to be obtained by the construction of the Forest-Railway.

Firewood.

15. The present annual consumption on the Southern Mahratta Railway is 52000 tons. About this quantity can be obtained from the Belgaum & Dharwar and that part of Kanara which is adjacent to the line.

16 I see no chance of a general demand arising for Kanara-firewood Every where, in the Southern Circle, people are allowed to collect wood either free or on payment of a nominal sum, and almost every where there is sufficient scrub to supply local wants from forest-areas close at hand. If, therefore, the railway-demand can be met from forests so close to the line, a demand for fuel from the more distant parts of Kanara is extremely improbable, and it is doubtful if fuel could be brought

from where the timber-cuttings now are (in the vicinity of Kalgi & Nyndavli Ambagi) and sold at a profit at the present price of railway-fuel.

17 To bring fuel from Mandvale (supposing the line to be carried on to that point) say 27 miles, would cost at one anna per ton per mile, Rs 1. 11. 0. the cost of cutting and stacking on the line in the Belgaum Division is Rs 2 per ton. The price paid by the Company is Rs 4, so that the profit would be, say, 5 annas exclusive of loading, unloading, stacking at destination and supervision, which would swallow up the profit of 5 annas and something more. But I do not imagine that workmen could be got to do the work as cheaply in the heart of Kanara as in Khanapur which is a comparatively civilized part of the country. And other things would not be as favourable for the workmen, as I have already explained in para 16 of my No 3380 of the 23rd October 1888 to Government.

Disposed of by GRN 6050/29/10/89 & 123/1/89 Return

18

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October 1888 to Government

18

R. Disposed of by GR No 1605 of 29/10/89
C 123/89 Return

18 For these reasons, I consider inadvisable to leave fuel out of the estimate

Sleepers

19 I do not think we are justified in assuming that so large a quantity as that shewn on Colonel Peytons estimate will be required by the Railway Company. It seems extremely probable that iron will come more and more into use for sleepers. In any case 10000 10 feet sleepers would, I imagine, be far more than would be required.

20 Altogether 607,000, six feet sleepers were supplied to the Railway Company. Taking 12 years as the lifetime of a sleeper, that number would be equivalent to an average annual consumption of 50583. Colonel Peytons estimate of 6 feet sleepers is, therefore, very modest from the standpoint from which he views the matter, namely, that the demand will continue.

21 It should be noted that, in

any

any case, since the demand for sleepers arose in 1884/85, renewals could not commence until 1896/97 according to my estimate of the life period of a sleeper, for which I cannot vouch

22 Colonel Peyton's estimate of receipts and expenditure on account of sleepers may, I think, be accepted if sleepers are to form part of the estimate

III

23 My estimate compares unfavourably with Colonel Peyton's that it may appear as if I were prejudiced against the scheme That is not at all the case. On the contrary, I think that if the present yield of teak-logs can be maintained, some sort of railroad should be substituted for cart-road. At the same time I know how easy it is to overestimate the advantages, and how necessary it is to be cautious.

24. A narrow-gauge may possibly pay where a broad-gauge line will not and I cannot help thinking that one of 24 inches could do the work and that to lay down one of 39 inches would be analogous to employing a sledge-hammer to crack a nut.

25 I think, too, that Colonel Peyton's route is by no means the best, the Alnāwar-Hallial or Knunbhargamvi-Hallial, one being, to the best of my belief, far preferable from an Engineering and every other point of view. In this opinion I have the support of Mr Gerrard, who carried out the survey of the line, and of Colonel Hutchinson, who lately conducted the survey of the tract of country which would be tapped by the railway

26 I have assumed that no log-timber will be brought to the Hallial-depôt unless the Hallial-route be adopted, and that in the latter event, no more than the quantity proposed by

by Colonel Peyton for extraction by means of the railway will be cut annually. I think the whole burden of transport ought to be thrown on to the Railway and that it would be a waste of money to bring in any timber by other means to Hallial or any other place near the Southern Maratha Railway.

27. A great difficulty in furnishing a reliable estimate lies in the uncertainty that exists in regard to the average distance at which cuttings will be from the line. I do not know if it is the intention of Government that the line should stop at Potoli or be carried on to Manduria or Hudse, or even Gund, or to all three places, but if the line stops at Potoli the lead to it will be at least 6 or 7 miles. The present rate of cartage is 4 annas a mile per ton for a distance of 27 miles. For a distance of 7 miles in the country beyond Potoli, the rates would, I

have little doubt be nearly double on account of the difficulty of dragging the logs to the cart tracks and the badness of the way until it meets the made road at Potoli. The cost of girdling, cutting, & squaring with the axe is now Rs 2-8-0 per ton. Colonel Peyton has, therefore, allowed Rs 9-8-0 for the cost of carting to the line, and placing the logs on trucks. I think this would be an ample sum for the purpose of the railway be carried on to a distance of 28 miles from Rajkumar, but it will hardly suffice if the line stops at Potoli

28 Potoli lies on a low hill at the meeting of the roads from Kulge, Anshi and Hallial Beyond it commences the typical upland ghat country, consisting of very steep but not very high hills intersected by numerous nalas Possibly the cheapest way of working the forests beyond Potoli would be to fix the terminus there, and to use portable tramways from that place to the

cuttings

cuttings which would be constantly shifting their position From Potoli the direction of the line would vary according to the situation of the cuttings, at one time turning at an acute angle to the left in the direction of Kulgi; at another to the right towards Hudda and Gund; in a third case running straight. Each of the tracts commanded by these three radii could be exploited in succession by means of the same rails, and the haulage of the logs be effected by bullocks as far as Potoli, if necessary.

29 To facilitate the comparison of the value of a rail road with that of the present means of transport I annex an estimate of the cost of carting the wood noted in my estimate

Carting to depôt. & Headlihal

(a) 3700 tons of log wood @ 1¼ annas per ton, per mile, a distance of say 27 miles ——— 87413

(b) 1250 tons of poles @ same rate, a distance of say 15 miles — 16406

103819

32 I am doubtful that the simple

Encl 12:55

3872 A

junglewood should for the purpose of this estimate be estimated as having to be brought a distance of over 10-15 miles. It is not necessary in order to get the required quantity of junglewood that it should be brought a distance of 20-30 miles, but it would be more convenient to have the log-cuttings all in one place, and as the teak logs must come from a distance of about 25 miles, I assume that the logs of junglewood will be brought the same distance.

I have the honor to be,
your most obedient servant,
J. D. Sandeman
Conservator of Forests
&c. &c.

Forests North Khandesh Front Railway. 38729

Letter from the Conservator of Forests Southern Circle, No 4278, dated 11th December 1888 – submitting the report called for in Government letter No 7770, dated 21st November 1888; & making remarks.

Subd

The papers on the subject bearing Regr No 3417 A in connexion with the report now subd was called for from the Collr have been unofficially transferred to the P. W. D., Railway, under No 7771 dated the 21 ultimo.

MW 26/12 These papers may be transferred unofficially in continuation

NDM Ans: Exf: 6 P.W.D. Railway Unofficial No 8667 –

No 44 23 1 89 | 19

Southern Maratha Ry. Company
Agent & Chief Engineer's Office
Dharwar, 8th January 1889.

To
The Conservator of Forests
Southern Circle

T. & Sleepers
Your No 3873 of 24. 11. 88.

Sir,

In reply to your above, I have the honor to inform you that I take the life of a teak sleeper to be from 12 to 15 years; rectangular creosoted pine sleepers will last 7 years

It is rather a difficult matter for me to give you any estimate of our probable requirements. I should say approximately about 8000 sleepers would be required per year, for the next 10 years, and the greater part being required towards the end of the 10 years, when the renewals will naturally be greatest.

I have &c
(signed) E. H Hullum
For Agent & Chief Engineer.

Recd 18-1-89

235A

No. 4642. of 1888/89

Conservator's Office S.C.
Camp Sirsi Kanara
District, 14th January 1889.

RECD
JAN 18
1889

Copy submitted to the Under Secretary to Government, Revenue Department, Bombay, with reference to this office letter No 4278 dated 19th December 1888.

[redacted]

Conservator of Forests S.C.

2357

Lambton Kanawa Forest Railway.

Memorandum from the Commissioner of Forests, Sydney No. 4642, dated 14th January 1889 – submitting with reference to his office letter No. 4278, dated 19th December 1888, copy of the following letter No. 86, dated 8th January 1889, from the Agent & Chief Engineer, Southern Maritime Railway Company.

(Here print the letter)

Subd.

The previous papers were transferred unofficially to the P. W. D., Railway, with No. 8667 dated the 27 ult. This may also be transferred unofficially in continuation.

22/1

22.

W'm

No. 388.

I don't know that any particular parts of the letter are worth while before [illegible] I may point out that Mr Macgregor has objected to Ray Lankester's [illegible] I am sure you may agree with me that Ray Lankester's instructions to the guardians in regard to the general direction of the business should be left entirely to Ray Lankester and not [illegible] his advice was followed - otherwise my enemy would have a valuable weapon against me.

I don't think any great stress should be placed on the fact that keepers of Nat. Hist. Sections [illegible] a certain amount of power to [illegible] but Nat. Hist. Dept. & Lib. Station also may reasonably want a voice in [illegible]

2358

Londis Kumara Light Railway.

Memorandum from the Secretary of Lands, dated 4th Inst., No. 4649, dated 4th January 1889 — submitting with reference to his office letter No. 4278, dated 19th December 1888, copy of the following letter No. 44, dated 8th January 1889, from the Agent & Chief Engineer, Southern Midland Railway Company.

(Here print the letter)

Subd.

The previous papers were transferred unofficially to the P. W. D., Railway, with No 8667 dated the 27 ult. This may also be transferred unofficially in continuation.

22/1

No 588.

I don't know what any

particular parts of the letter

are about but the object of my

visit to Jaipur would be

for transacting the business

Raj Kumari as the country point-

of view purposes Rajputana. The

I don't want any of the fees I

don't know but Sir Swami was

instructed to be guided by him

in the first instance as to the

general direction of the transaction

distributes this sum to the Land

holders start from Raj Kumari and

his advice was followed - Now as

the enemy would have contact

them much from Rajputana

I don't think any great effect

should be placed on the lack of feed

troops with R Some will always

be wanted much points & carriage is

but the Govt S L & to estimate this

the amount would be Rs. 8000

1423

[illegible]

[illegible]

[illegible]

10772A

Harwich Branch Rly
Bill

The proposal to con-
struct a light railway
to carry the provisi-
of which Harwich
direct communicat-
with the Southern
Railways by means
the Harwich Ferries
by which goods
started last year
which also would
more effectually
carry on the
correspondence between
the Admiralty Post Office
the Commissioners Inspector

and the Grant

Authorities a note

on the proposal dated

17th June 1887 drawn

up by the Committee

Rs. 1887 and Govt.

Resolution No 232 of

12th Jany 1888 [illegible]

based on the Recom-

mendation ordering the

Survey to be carried

out, Mr. Edmonds, Sur

Supt being appointed

by the Govt of India

to undertake the

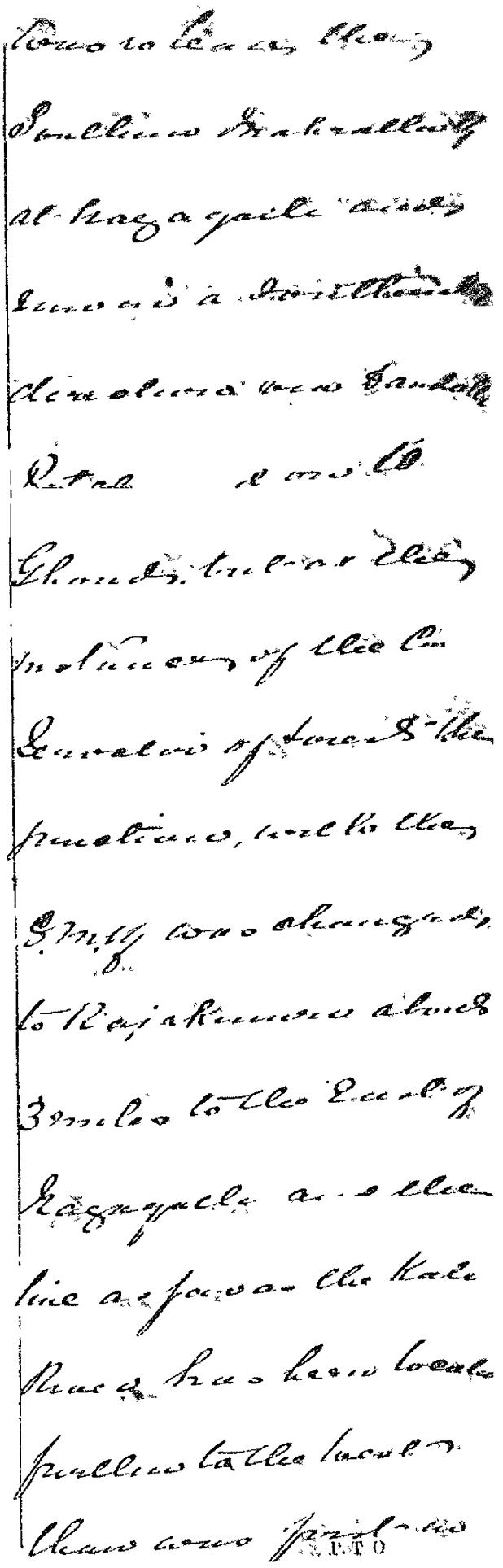
work.

The Survey has been

completed, and the

Inwd Rec'd Comp 236/87

Plans, Sections &c
Respecting the Oxford
Railway.
The Directors beg
to submit to the Committee
the Plans, Sections
Books of Reference
which they have deposited
with the Clerk of the Peace
for the County of Oxford
in order to obtain the Powers
of the Railway Act, by the
Standing Orders of the
House of Commons.
The Directors will be ready
to explain the Nature of the
Railway, by the
Engineer, and the Nature of the
Parliamentary Powers
which they have to obtain
with regard to the
Land and Property
through which the Line
of Railway is intended
to be carried.



P.T.O

Finally, the objects
of the Clemency of
humble suitors behoveth,
that our noble Chris-
tian Emperor should
keep the Sacrificing
Vestal-perpetual
Virginia, but
presently out of hand
send for the
Vestal Virgin, and
from the Sacrificing
block cut off her
head: for the Gods
cannot be pleased
or appeased
with the sacrifice
of a wicked
person, for they
hate wickedness,
~~thoughtlessness~~
Abomination to sacrifices
and badly affects

The total Valuation of
the Property in the
Municipality amounts
to £3,42,357 or £16,000
per mile.

Of the 13.85 Miles
Localised, 8.46 Miles
on the Ohiowhit and
5.39 on Canoe Cliff
350 ft. Calcareo Shale
& 3.68 on the Chalk
Marl and after
Valuation, 8.27 Miles
on Grades of 1 in 50
and under, the longest
Continuous rising
1 in 37 Length 4384 ft. Curves
There are no very long
tunnels or cuttings

the Justices thereof
and the Justices of the
the aforesaid Assizes
to them, have Cognizance
Cancel and
by the Statute of
the Parliament, the following
Powers assigned
shall proceed.
In the Second Year
Parliament of the
how soever here
Sheriffs, Bailiffs
Indentations, Returns
Juries, Writs
Inquisitions - Writs
Writs, Offices, Ind-
Cancelling the

Conformable to the
Instructions given
to me by the Commissioners
of Stamps
I Emanuel Bingham
Sale Rules do not
give the Vendor
Power to elect
to sell by Auction
or Private Contract
but I have always
done so
Emanuel Bingham

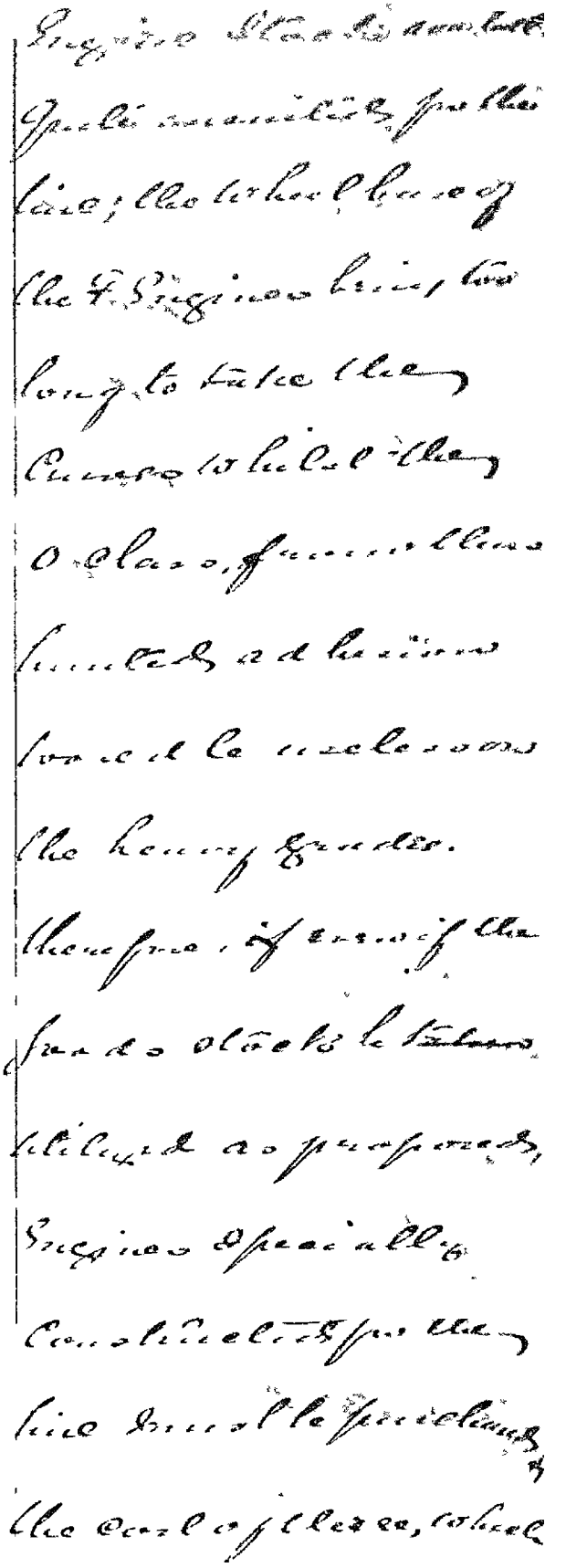
The first Item of this Estimate
are Building Lines
and Telegraph Lines
Total Estimate £8,660 per
Mr. Engineer
Charing 5% for Superin-
tendence -

Stations & Buildings

The Buildings have
been designed on
the Principle of
Lines in accordance
with the Committee
Suggestions in Stations,
but the Plans of the
Stations have not yet
Report submitted to

The two sets
of £3,69,652 & £17,600
for make expenses
Compared with the
the appropriate
Estimate of the
Consulting Engineer.

Rolling Stock - In
Accordance has been
Made on the foregoing
Estimate, for Rolling
Stock, as the original
intention was to have
from the S.W.R. The
Charges of Gradients
have not to [illegible] 37, together
with the Charge across
the Leeds Line,



The project was then
well received but it
would have been better
to have made the junction
with the Fork at
Ragargalle although
this might have increased
the length of the line
by a mile or a mile
and a half. — The
removal of the forest
depot from Ragurumma
to Ragargalle could
not be a large business.

The survey has
distinctly shewn the
nature of the country
to be traversed and
the class of railway

which could be
contributed as reason
to a cost it may
therefore be said has
been fulfilled in
principle so far..
So long as there is no
practical change of
location the exact
alignment which
may be finally adopted
will not materially
affect the mileage
rate now ascertained.

Accepting the additions
made by the Warden
which seem necessary
and allowing Rs 26,400
for the additional mileage
I suggest the total

Estimate for the Extension
from Pattoki Station to
2 2½ miles. Alignment
handed in; estimating
Rs. 90,000 for 5 miles
in connection, Rs. 36,000.
The mileage cost - exclu-
ding connections
being Rs 17,000
Considering that the
line would be worked
little more than half
the year & think here
Indian lines rather
under rated. The working
Expenses which on the
same data may be
taken Rs 30,000
We shall then have
no regards the financial

Distribution Capital: Rs 19,440
Working Expenses 30,500
Rent of stock 3560

Total Rs. 53,500

Whether the increased annual sales of timber due to the 22 miles of line will return a profit to the extent can only be decided in the Forest Dept.—

The Rates may now be seen in the Rev. Dept as regards the Launch of Junction hill to Kluke and Kuballe profits will be derived from the Prospect—

Mr. not Cadell for
the Light Co. herewith
Calcutta Rates Rangoon
Rates as suggested
by Mr. Gerard. —

17/10.

Hon: Mr. Naylor 12/10 Gen

Hon. Mr. Risley

Rev. Dept.

The question estimates
w. R. out to Mr. Jarrett
as their letter forwarding
Engr. note of 17/6 - Sry form
time of 30 miles, &
supra
cultivation we may assume
that the estimates are very
near the truth & the mean
factor of Rs 17,600 per
mile may be accepted as
quite safe
Another consideration strongly
may be rightly drawn that
as that of the forests of Pabna
and Coorg are both the

P.T.O

Profitably worked it must
be by rail & steam - The
cost of road making & haul-
ing by animal power will
be greater - incidentally -
Even if a mill & steam
power with fuel at a
nominal price.
But I do not feel satisfied
that with special enquiries
we should be right to ac-
-cept amp. tenders
Major Scobie's estimate of a 60 ton limit
on this point should the
Committee require
Mr Ryland estimates 40 tons
with 1 in 8 inquiries
I do not know whether the
estimate includes anything
for depreciation of engines
nor what the charge should be
but if we are to spend
60,000 on engines there
must be some charge on
this account somewhere.
If by adding 3 or 4 miles
to the length of the line I
could be made to end this
1 in 12. enquiries might

be cheaper in the end. not whether this is taken, tobe paid is for apparatus &c.

I would be well for the Ranger Deputy Con to examine & report on the suggestion at the close of Mr Gerard's para II as to the Station at Rapa Nui.

Meantime any question that in Mr Deputy Con's to the advantage from the Forest P. of view of taking off the Cuts from Rapa Nui rather than Rangitaki & as to the estimates of values, on presumption that Mr Peyton's estimates as a basis the Conservator should examine those estimates carefully in the light of all addl information which he may have collected. Extract of the Colonials at the close of Mr Gerard's para IX may be forwarded to Mr Macgregor

P.T.O.

22 11 88 1

When the reference on the above parcel has been made therein the papers may be returned forwarded to the Railway Dept.t for note on the pebbles and called above & any other that call for remark

JP 21/11

Re. transferred

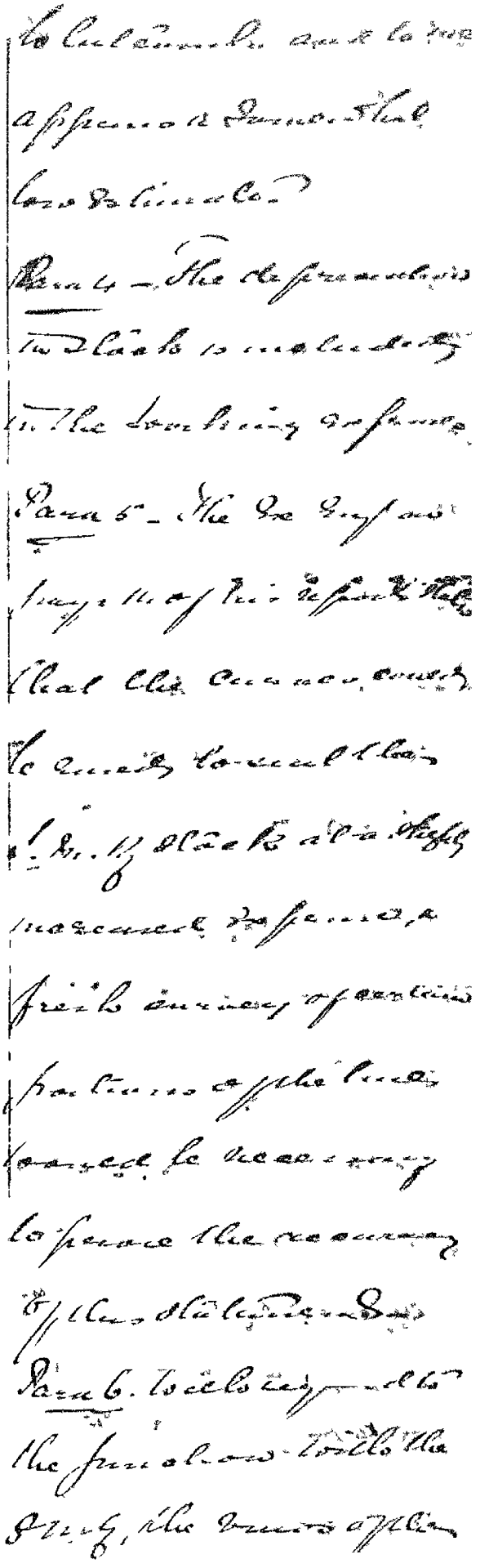
34174

un-officially to the Railway Dept.t after issue of the reference to the Conservator of Forests

S. C

J M Mills
Ag.t Secy & Govt.

El O No 7771
21-11-88



Rhode Island Co

of Council: Resolution

in the Assembly passed

to Ray Kansas

No

Jan

All the officers were unfor-

tunately engaged up with the

question of their pensions &

I had to bring on first. Shall

go into the matter & push despatch

The Consequence was I got them

on the table & made my

best general inspection of M. S. & I

& shall not finish out the month

until afternoon

Progress towards the clearing

of the prospect is slow, & it

seems necessary to decide whether

to [redacted] lean on the side of

the Boylston figures or those of

the Lexington. The latter gentlemen

To [illegible] Sh R.

Via Hatfield & Dr. Smith,

[illegible] the range of

hills which [illegible] cape

Town & would have such a

route

Mr Macqueen said good such

thing could [illegible] 24 in. gauge

but I cannot recommend that to

be tried [illegible] Sh Govt to [illegible]

It seems true that in this

very unsettled country we want

to get a fairly good branch line

from the S. Ha. R. some 20 or

30 miles into Rhodesia, & when

the time has arrived to start this

should certainly be able to go through

both the [illegible] & 2-ft gauge

of a few miles in length & [illegible]

[illegible] in the ground might be

arranged, just as recommended

for Rhodesia finding as cheapest

& handy, & then Rhodes from

the spot when settled Mr Parnell